JANUARY 19, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

If you are involved in any way with the specification, selection or application of ferrous or nonferrous alloys, turn to page 80 for the story of a new and cross-indexed SPECIFICATIONS HANDBOOK available through STEEL as an extra service.

PAGE 80

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ALLIS-CHALMERS COMPLETE DRIVES

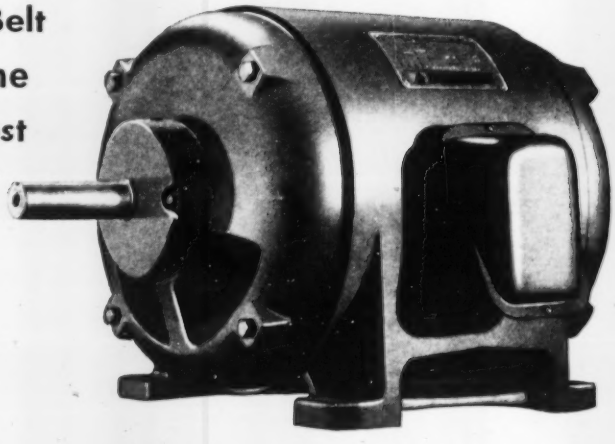
Simplify

YOUR DRIVE DESIGN PROBLEMS

Allis-Chalmers Matched Motors, Control and V-Belt Drives Save Design Time and Cut Installation Cost

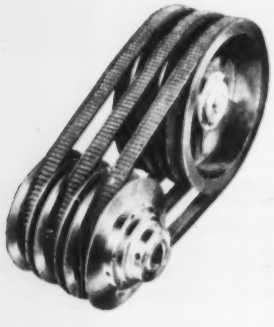
CONTROL

Complete matched control for any motor, including manual and magnetic starters, pushbuttons, and variable speed control.



MOTORS

Standard open drip-proof, splash-proof, totally-enclosed, fan-cooled and explosion-proof, ½ hp and up. Also wound rotor and direct current. Special motors to meet your requirements.



Texrope V-BELT DRIVES

Fixed speed and *Vari-Pitch* sheaves with stationary or motion control. Famous grommet belt construction. Most complete line of V-belt drive equipment in the industry.

Get the Kind of Help You Need

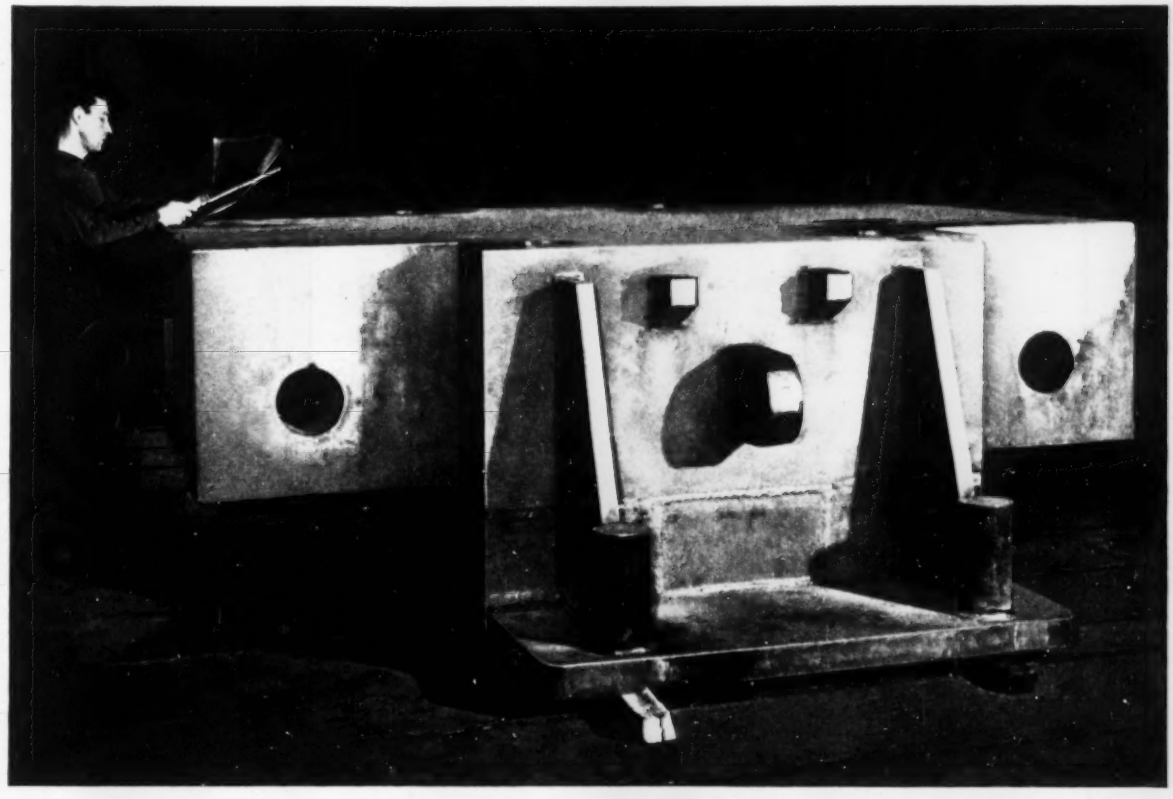
Allis-Chalmers representatives in every industrial center are at your command. Just call the office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin for helpful literature.

Allis-Chalmers Motors and Control	51B6052
Texrope V-Belt Drives	20B6051

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

A-3780

ALLIS-CHALMERS



This 52-ton Weldment is Base for Forging Press

Designed to support a 1000-ton forging press, this weldment was formed by combining forgings and plate steel. It is 152 in. long, 123 in. wide, and 43 in. high, and weighs 103,673 lb. It was made in Bethlehem's Weldments Shop.

If you require bases, frames, perhaps an entire press, or some other type of manufacturing equipment or parts, the chances are good that your needs can be met economically, either wholly or in part, by using Bethlehem Weldments.

ADVANTAGES OF BETHLEHEM WELDMENTS

1. Bethlehem Weldments eliminate excess weight, without any sacrifice in rigidity. This frequently leads to a reduction in manufacturing cost for the finished product.

2. They are versatile, for they can be made in a wide size-range, either as simple parts or intricate assemblies.

3. They offer greater latitude in product design, for the steel from which they are made can be bent, pressed or otherwise shaped prior to welding.

4. They can be used alone, or can be combined effectively with forgings or castings.

★ ★ ★

If you would like additional information about Bethlehem Weldments, the nearest Bethlehem office is at your service.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

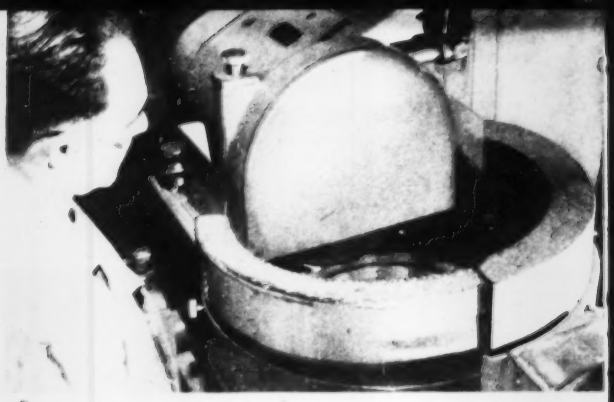
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

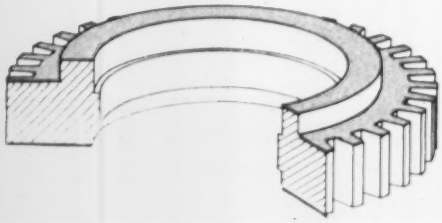
BETHLEHEM WELDMENTS

BETHLEHEM STEEL

Heald Model 261 Rotary

GRINDS 3 FACES



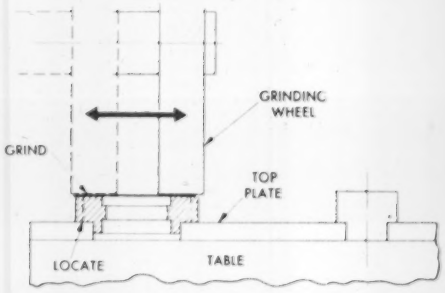


Two faces and hub end of steel gears surface ground on one machine, with quick-change setup

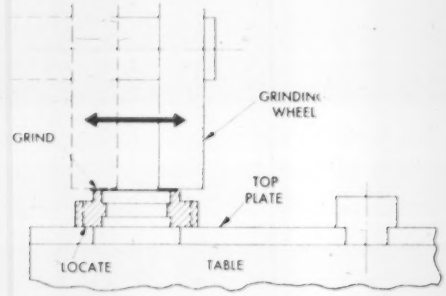
A gear job like this is a natural for the Heald Model 261 Rotary Surface Grinding Machine. The setup illustrated here combines high precision with fast, easy operation and quick changeover for each of the three surfaces ground.

An auxiliary top plate fastened to the rotating chuck is recessed to hold ten gears for the first two operations. A stake fixture in the center holds the parts individually for the final operation. In the first operation, the gears are ground ten at a time on the large face opposite the hub. For the second operation, the parts are turned over and the hub ends ground ten at a time. In the third operation, the parts are transferred to the stake fixture in the center of the chuck, where they are ground singly on the adjacent hub face.

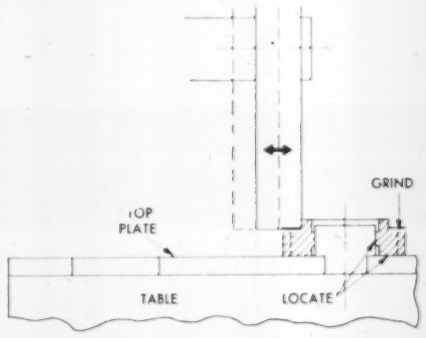
Remember — when it comes to precision finishing, it pays to come to Heald.



First Operation: Parts ground ten at a time on large face.



Second Operation: Parts ground ten at a time on hub end.



Third Operation: Parts ground singly on adjacent hub face.

HEALD

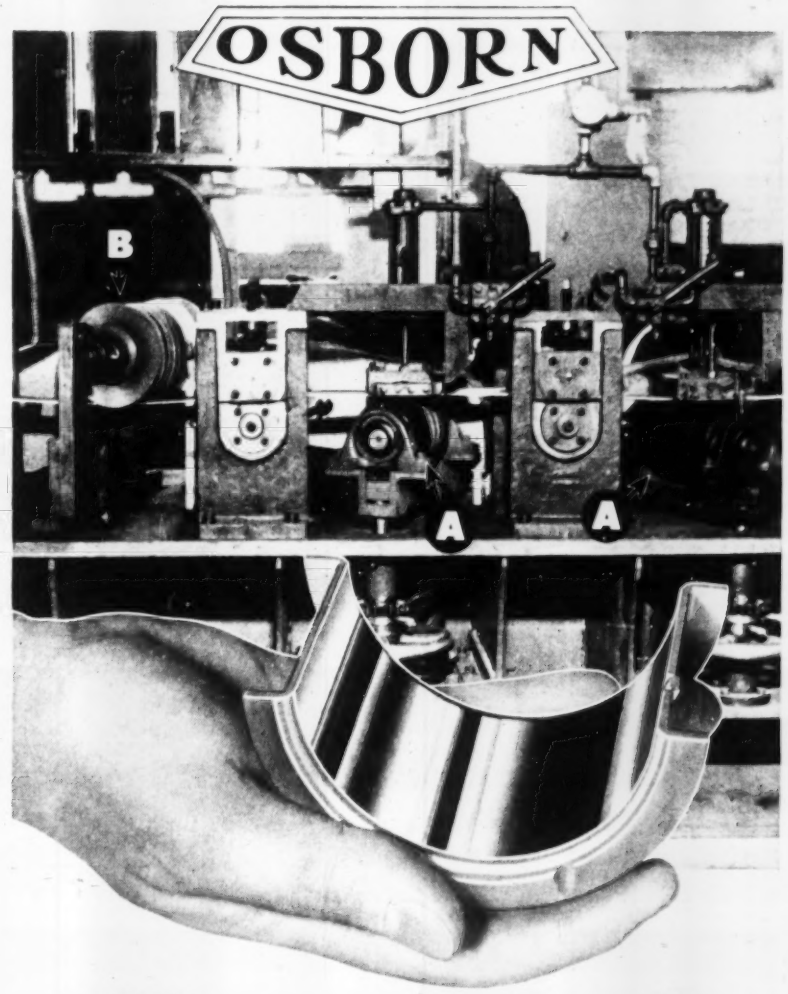
INTERNAL AND ROTARY SURFACE GRINDING MACHINES AND BORE-MATICS

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

Heald precision speeds the nation's production



Will "automatic" ideas like these cut your costs?

THIS machine does two jobs at one time . . . does them thoroughly by power brushing . . . at the push of a button.

Perhaps a similar brushing method can help cut *your* costs, boost *your* production and improve the quality of *your* products.

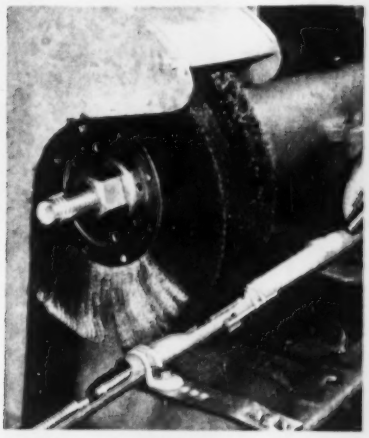
The machine developed with the help of the Osborn Brushing Analyst cleans steel-backed, babbitt-lined strip for production of automotive sleeve bearings. With the strip traveling continuously, Osborn Master Wheel Brushes (A) remove all dirt, rust and metal particles from the steel surface. Osborn Monarch Sections (B) then thoroughly clean the babbitt side.

This is typical of the cooperation which your Osborn Brushing Analyst can give *you* to solve problems of product cleaning, burr removal, roughing, polishing and finishing. For help, call or write *The Osborn Manufacturing Company, Dept. G-2, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

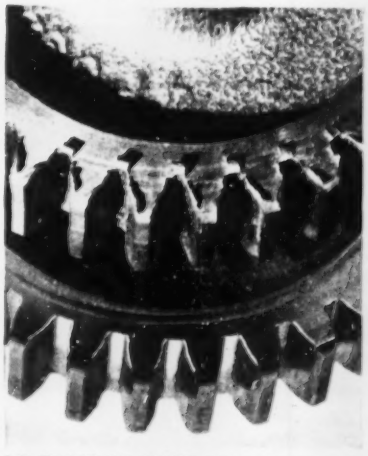
Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

SAVES 12 MEN. This is one station of a five-station rotary automatic machine equipped with Osborn power brushes that removes burrs and sharp corners of clutch disc teeth. Formerly done by hand. Saves 12 skilled men.

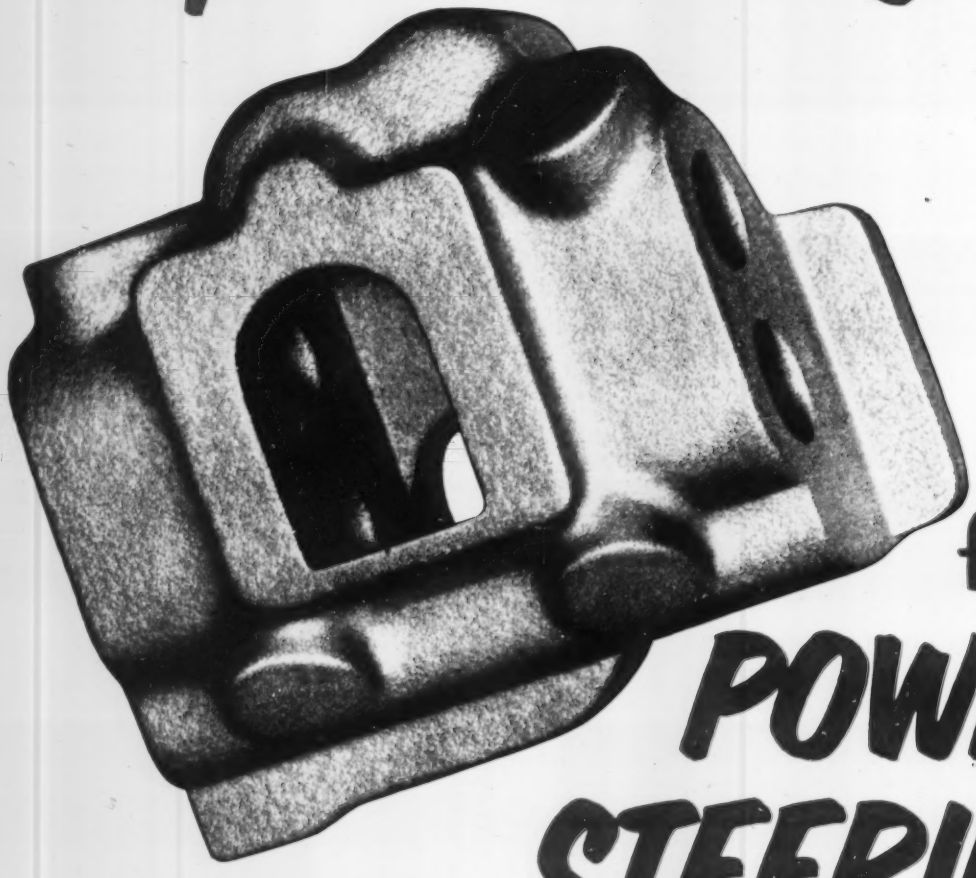


9 TIMES AS FAST. This simple pipe fixture provides the means of cleaning threads of set screws. Can be applied to many cylindrical parts. Time was cut from 18 seconds to 2 seconds with this Osborn brushing idea.



10 TIMES AS FAST. This shows two gears before and after deburring by a new Osborn power brushing method. Note smooth uniform results. Time was cut from 5 minutes to 18 seconds.

Eaton Permanent Mold Gray Iron Castings—



for

POWER STEERING

Send for your free copy of the 32-page illustrated booklet: "The Eaton Permanent Mold Foundry." It tells the story of Permanent Mold Castings and takes you on a picture-tour of the Eaton Foundry at Vassar, Michigan.

EATON MANUFACTURING COMPANY
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PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

This Week in Metalworking

STEEL

Vol. 132 No. 3 Jan. 19, 1953

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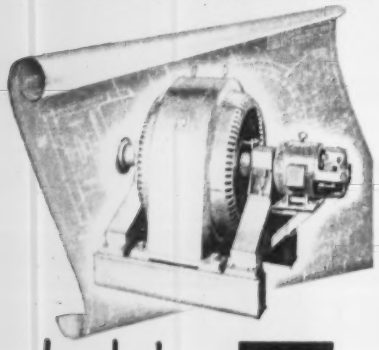

look to... EP

Since 1909, the job of The Electric Products Company has been to create and develop special electrical rotating equipment . . . motors and generators to do existing jobs better or to reach into new fields to do jobs that couldn't be done before. The natural "by-product" of our more than 40 years of specialization is that you get equipment designed and built to the exact requirements of your application . . . equipment that has greater dependability, longer life and that requires less maintenance.

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Behind the Scenes...

Sign of the Times

Introduction of the administration's budget 10 days ago reminded us of a bit of intelligence relayed by New York Resident Editor Sam Baker on an assignment in Washington. It forces us to regard all budget proposals as something that should be taken with more than just a grain of salt.

While roaming through the Pentagon's endless maze, this correspondent relates, he came upon the following sign in the Defense Department comptroller's office:

BUDGET PHILOSOPHY
. . . That a man's reach must exceed his grasp, else what's a heaven for? . . .

Cover Stuff

We'd like to call your attention to the story on page 80 of this issue. It's all about the new "STEEL's Specifications Handbook." We think the Handbook is a hot item. You'll want to read the story behind its development.

New Editor

Spotting a new face in the editorial department upstairs and being naturally nosey, we have now met Van Caldwell, new assistant editor. He's going to work primarily on editorial layout and presentation.

Van has a bachelor's degree from Hamilton College and a master's degree from Western Reserve University. He's married and has one child.

Optional Standards

We were interested to note that the Department of Agriculture has authorized a revision in the standards pertaining to size of the holes in Swiss cheese. New standards are purely voluntary and the main purpose is to give cheese traders a common language.

The former standards called for a hole $\frac{3}{4}$-inch in diameter. Revision permits new holes to be $\frac{1}{2}$-inch across. There's no mention of limits, so we assume it's plus or minus nothing.

In case you are getting cocky, thinking they did this to give you more cheese, we'll tell you that it was done for another reason. It seems the holes grow as the cheese is aged and the department feels the extra aging to get $\frac{3}{4}$-inch holes is unnecessary and does not substantially change the quality of the cheese.

Let us know if any of you are interested in joining a pressure group to agitate for a corresponding percentage *increase* in the legal size of shot glasses.

One Point of View

According to their report on a recent "Stockholder Opinion Survey," Pitney-Bowes Inc., Stamford, Conn., got the following answers from a stockholder named Groucho Marx of Beverly Hills, Calif.

Asked what factor most influenced his decision to buy the stock, he replied, "The wind was from the north."

His rating of the company's annual report was, "tops in fiction."

Puzzle Corner

Answer to the puzzle in the Jan. 5 (Yearbook) issue is that Al and Sam's horse clips along at 33 feet per second. First in with that one were George W. Frederick, Republic Steel Corp. and R. D. Borden, Ebasco Services Inc.

Here's this week's. For some time now Sam and Al have been collecting bottle caps up at their hunting and fishing cabin. Last week they decided to tack the caps to the wall in a neat pattern.

First they tried nice even rows of 10 caps each. When they got to the last row they had only 9 left. Then they tried rows of 9 each but the last row had only 8 caps.

Then they tried rows of 7, 6, 5, 4, 3 and 2 caps, but each time the last row had one cap short. How many bottle caps were they trying to hang? (They could have opened one more bottle and saved themselves a lot of trouble, but they're stubborn and we wouldn't have had a puzzle.)

Shrdlu

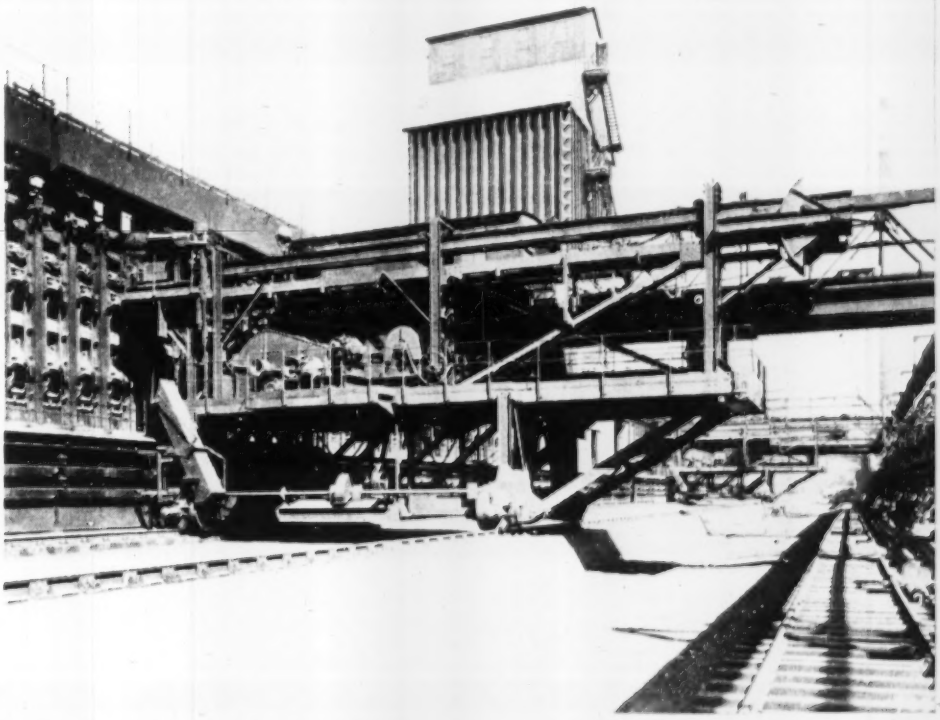
(Metalworking Outlook Page 37)

Wellman will build it

Special Cranes
Coke Pushers
Gas Producer Plants
Ore Bridges
Charging Machines
Forging Manipulators
Gas Flue Systems
Gas Reversing Valves
Mine Hoists
Skip Hoists
Clamshell Buckets

→ Wellman coke pushers

...engineered for economical, trouble-free performance



Wellman Combined Coke Pusher, Coal Leveler and Door Extractor in operation at Bethlehem Steel's Lackawanna Plant.

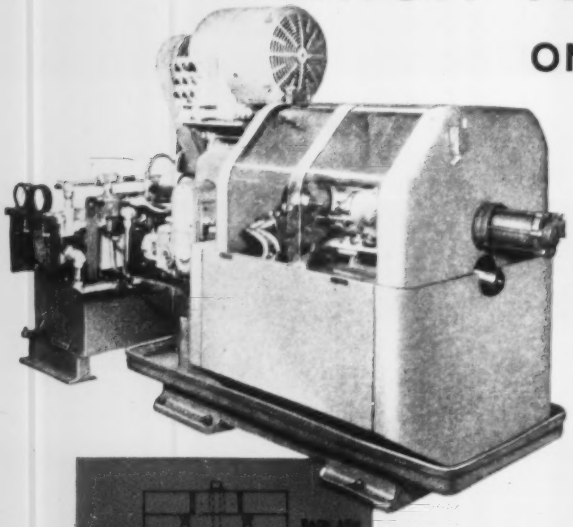
● Many of the world's most modern byproduct coke oven plants are Wellman equipped. The Wellman Engineering Company's more than half-century experience in building heavy machinery guarantees sound design and expert construction. Wellman equipment provides peak economy, maximum safety and trouble-free performance under a wide variety of operating conditions.

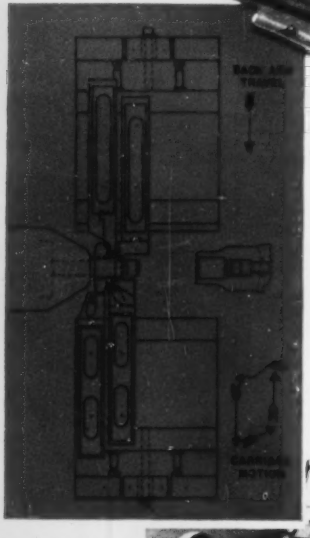
THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE · CLEVELAND 4, OHIO

AUTOMATICITY BACKS UP HIGH VELOCITY TURNING

ON FAY AUTOMATICS





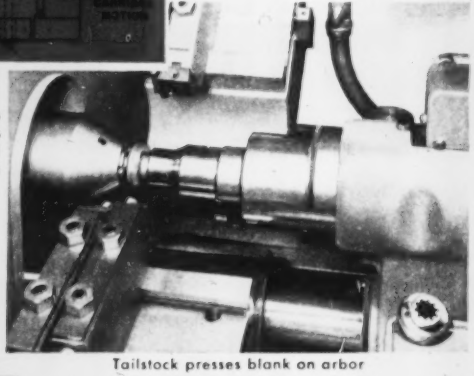
SIDE GEARS
18 Seconds Floor to Floor — 635 SFM

Two 8" Fays, with Automatic Sequential Control, machine all exterior surfaces of the blanks in two operations; one machine for each. The major diameter is 2-15/16" and floor to floor time is approximately 18 seconds in each operation.

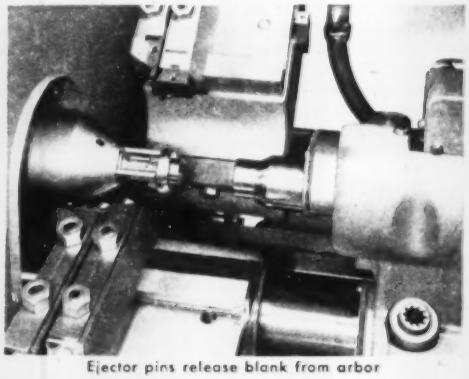
Automatic Cycle — The machines are equipped with automatically operated splash guards and automatically air-operated tailstock rams for pressing the blank onto a splined arbor equipped with automatically operated ejector pins.

The operator places the blank on the end of the arbor, and pushes the cycle start button. *Automatically, the guard closes, the tailstock ram presses the piece onto the arbor and then retracts. The carriage turns, the back arm faces, and at the end of the cuts, ejector pins push the piece onto the loading section of the arbor* from which it is removed manually.

FIRST OPERATION:
Note intricate movements of the carriage, which turns the hub, back angle and major diameter. The back arm faces and forms.



Tailstock presses blank on arbor



Ejector pins release blank from arbor

Production management regularly relies upon the engineering services of Jones & Lamson for the latest information on methods, costs, tooling and performance. Why not consult us about YOUR *turning, threading and inspection problems.*

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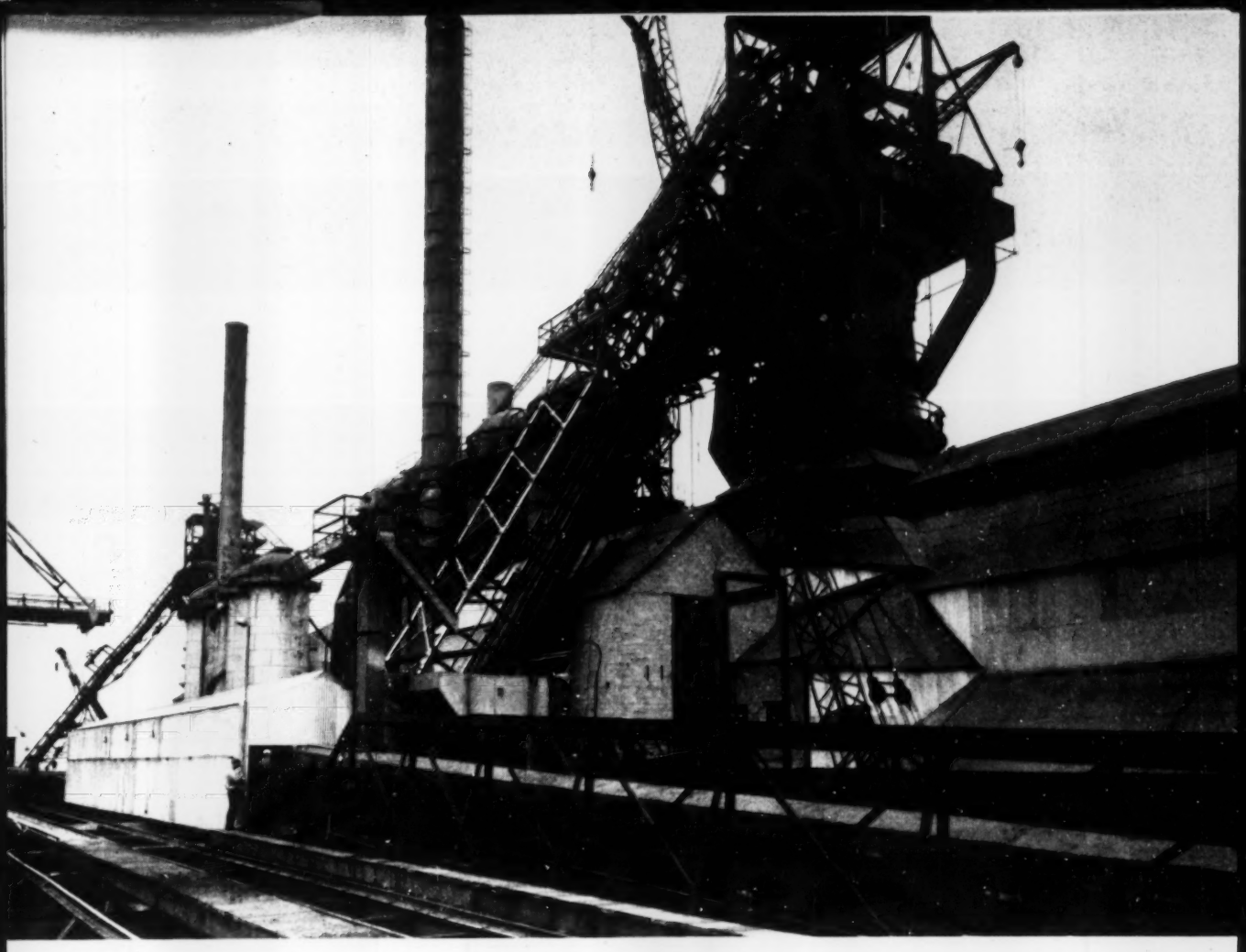

Now ready to make more Neville Pig Iron for you

THE new blast furnace at our Neville Island plant is now in operation. Its production substantially increases our total output of Neville Pig Iron for the foundry trade. The new furnace will provide an even wider range of foundry and malleable grades and will enable us to serve our foundry friends better than ever. ● We will be glad to discuss your requirements with you.

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Quality Pig Iron for the
Foundry Trade

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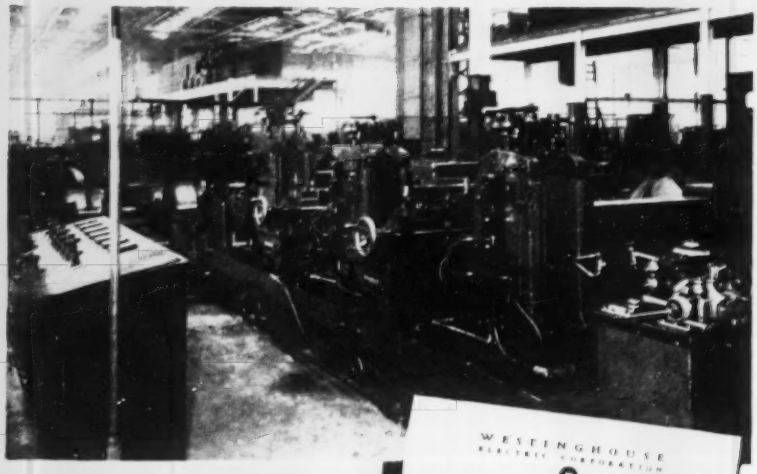
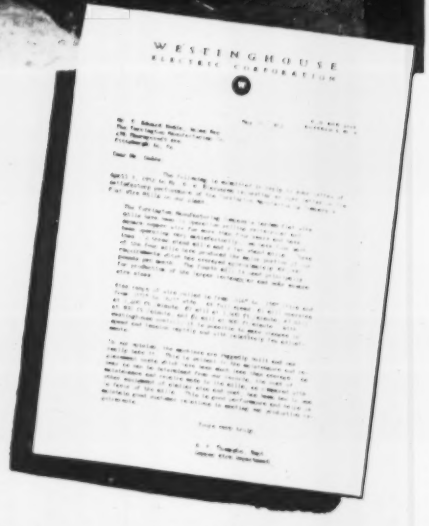
TAKE IT FROM Westinghouse





TORRINGTON
high speed
FLAT WIRE MILL
LINES...

are ruggedly built...can really take it
...cost only 1/10 as much to maintain

The Superintendent of Westinghouse's Copper Wire Department at Buffalo — who has watched his 4 Torrington High-Speed Flat Wire Mill Lines deliver the goods for more than four years, writes:

"The machines are ruggedly built and can take it. . . . Cost of maintenance and repair, as compared with equipment of similar size and cost, has been ten to one in favor of Torrington Mills. This is good performance . . . and helps us maintain good customer relations in meeting our production requirements. . . . Three of the four mills have averaged 900,000 pounds per month; the 4th mill is used principally for production of the larger rectangular and near square sizes."

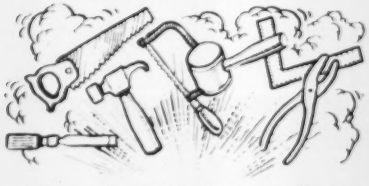
Call or write Torrington for information and name of nearest Torrington representative.

The **TORRINGTON**
MANUFACTURING COMPANY • TORRINGTON, CONNECTICUT

DESIGNERS AND BUILDERS OF MILL MACHINERY FOR SIXTY-FIVE YEARS

LETTERS
TO THE EDITORS

Blasting Tool Adds Tool Life



We noted with interest your "Production and Engineering News at a Glance" item on p. 103 of the Dec. 15 issue of STEEL, stating that a blasting tool had been perfected using 5000 grit materials which adds to cutting tool life. We would like very much to learn if there is a distributor for this type tool in the Los Angeles area.

If you do not have this information available, can you advise whom we should write?

R. M. Price
district purchasing agent
Aluminum Co. of America
Los Angeles

• *Write to the Cro-Plate Co. Inc., Hartford 5, Conn., for further information on the blasting tools.—ED.*

Congratulations

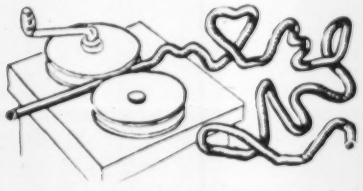
We are very pleased with your article "More Indium Metal—Can You Use It?" (Dec. 8, p. 98) and would congratulate you on the interesting way in which you have presented the material. It is very easy to read.

L. V. Whiton
Consolidated Mining & Smelting
Co. of Canada Ltd.
Montreal, Canada

We wish to thank you for forwarding us a copy of the article which appeared in STEEL (Dec. 29, p. 129) regarding the organization of our company. This is a very fine magazine and reaches many fine people.

James A. Quaid
Quaid Fabrications Inc.
Philadelphia

No Need of Hand Straighteners



In the upper left hand corner of p. 165 of the Dec. 1 issue of STEEL there is an illustration of a straightening machine and some comments on a straightening machine. We believe this is meant to be a news item and if so we would like to take exception to a statement in the item. The statement "high production speeds on standard tube straightening machines do not guarantee a high quality of seamless brass and copper tube" is in error. It does not apply to a Medart Straightening Machine, and we believe that the wording of such statements should be made in a manner that would not be so all inclusive.

Our standard tube straightening ma-

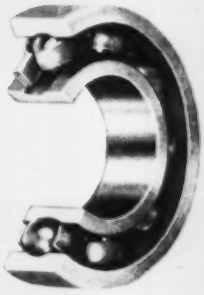
Continued on following page

NICE Announces New Lines!

PRODUCT DESIGNERS will be interested in these new "cost saving" additions to the NICE Line. FOR COMPLETE INFORMATION WRITE FOR CATALOG NO. 150.

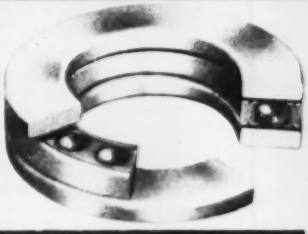
"C" SERIES GROUND RADIAL BEARINGS
SOLID RACE TYPE WITH BALL RETAINER

The new NICE "C" series are precision radial bearings made in inch dimensions which correspond to established light duty inch standard sizes. Produced with ground and polished race ways and assembled with chrome alloy balls, they are designed for light duty radial, thrust or combined load applications and speeds in the neighborhood of 5000 R.P.M. maximum. "C" series radials are available without shields, single shielded or double shielded.

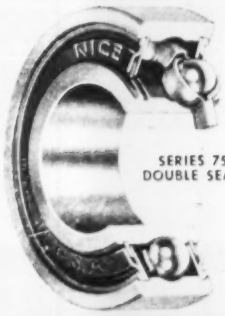


"FR" SERIES GROUND THRUST BEARINGS
FLAT BALL RACES WITH BALL RETAINER

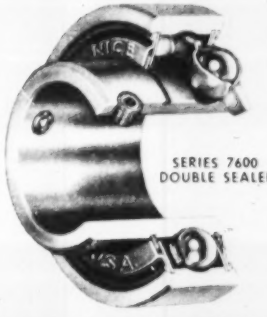
"FR" series flat race thrust bearings conform to established inch standard sizes and are recommended for light loads and speeds up to 2500 R.P.M. The ball cages are made from solid brass stock for durability and long life and the ball track surfaces are precision ground to a high finish



7500 AND 7600 SERIES GROUND RADIAL BEARINGS
SOLID RACE TYPE WITH BALL RETAINER-LABYRINTH COMPOSITION SEALED



SERIES 7500
DOUBLE SEALED



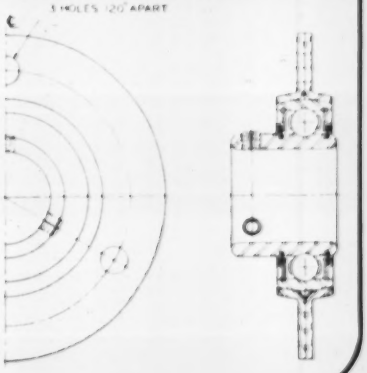
SERIES 7600
DOUBLE SEALED

Series 7500 and 7600 bearings are recommended for applications requiring the accuracy of rotation and quiet performance of close limit precision bearings, and where a highly efficient seal is required to retain lubricant and exclude foreign materials. They are designed for medium loads and speeds in the neighborhood of 5000 R.P.M. maximum, and are made in inch standard sizes. Normally double sealed, series 7500 and 7600 bearings can be produced to order with seals on one side only or without seals.

SEAL DETAIL
An oil resistant synthetic rubber coated fabric ring fits into a groove in the inner race and the recess formed by the inner and outer dust caps.

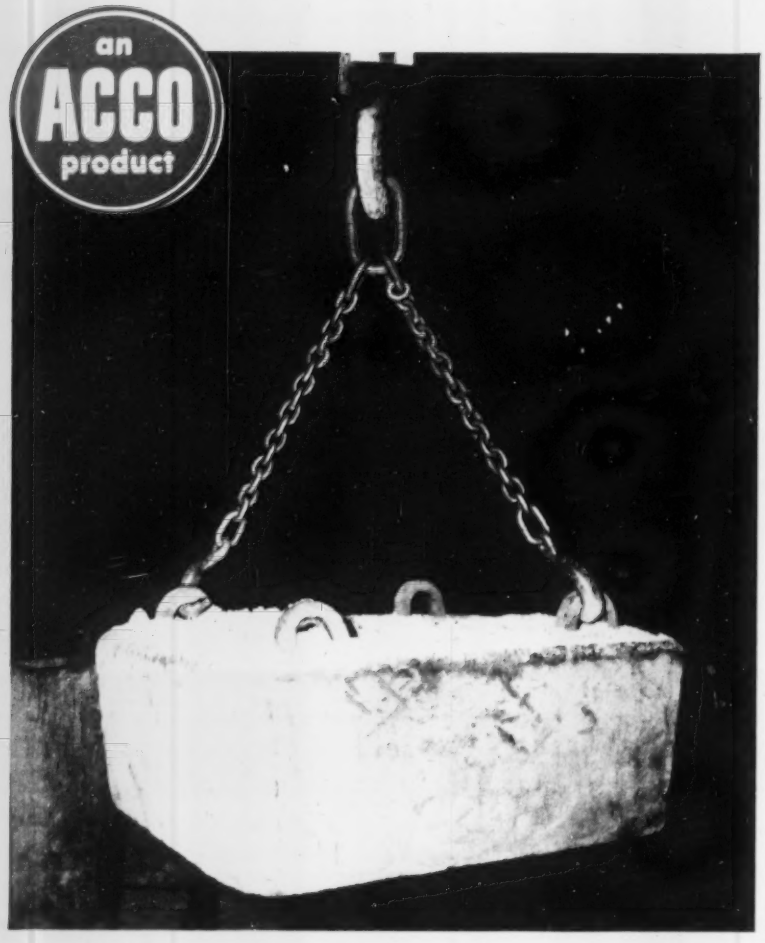
FLANGE MOUNTED SELF-ALIGNING RADIAL BEARINGS
LABYRINTH COMPOSITION SEALED-TWO LOCKING SET SCREWS

NICE series F100 flange mounted radial bearings are designed for easy application to machine frames. The self-aligning feature together with their highly efficient labyrinth composition seal (see detail above), makes them ideal for a wide variety of applications such as farm machinery, conveyors, power transmissions, blower and fan installations. They are available in popular inch shaft sizes and are recommended for medium load and speed service conditions.



NICE

NICE BALL BEARING COMPANY
NICETOWN · PHILADELPHIA · PENNSYLVANIA



Why Workmen Like ACCO Registered Sling Chains

• One rigger said: "It's a neat factory made unit that we know is made properly." A foreman said: "My men look for the identification ring. It's sort of a safety indicator."

Every ACCO *Registered* Sling Chain is built and tested as a unit and bears the ACCO identification ring. The sling illustrated above has ACCO Foundry Hooks designed for use on casting molds which get very hot. It is engineered for this particular job and will give long service. It is one of the many types of *Registered* Sling Chain made by AMERICAN to handle safely all kinds of lifting jobs.

Check today with your AMERICAN CHAIN distributor who will help you decide on the correct ACCO *Registered* Sling Chains for your use. Or, write our York, Pa. Office for a copy of **DH-314** ACCO *Registered* Sling Chain Catalog.

ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

American Chain

TRADE MARK

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LETTERS

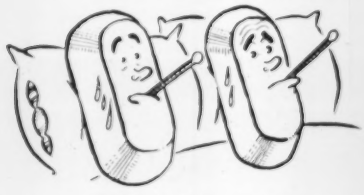
Concluded from preceding page

chines do guarantee a high quality of seamless brass and copper tubing at high production speeds and we do not require that plant officials include manual work to secure desired straightness.

W. J. Pixley
vice president, sales
Medart Co.
St. Louis

• *That story was originally retracted on p. 189, Dec. 15 issue.—ED.*

Checking on High Temperatures



Your article entitled "Metals in the Jetomic Age" (Oct. 13, p. 148) is of great interest to me.

Could you advise me from whom I could secure additional information regarding high temperature alloys. Would also like to know if this material is available and where same could be obtained.

Clark E. Gordon
Clark E. Gordon Inc.
Detroit

• *Sources for further information are: Battelle Memorial Institute, Columbus, O.; Armour Research Foundation, Chicago; Temple University Research Institute, Philadelphia; International Nickel Co., New York; Haynes Stellite Division, Union Carbide & Carbon Corp., Kokomo, Ind.; and National Alloy Steel Division, Blaw-Knox Co., Blawnox (Pittsburgh), Pa.—ED.*

Now Is the Time

Speaking as an old time consulting machinery salesman, distributor and manufacturer, may I congratulate you in the breadth and expression of your article "Now Is the Time" in your 1953 annual issue (Jan. 5, p. 111).

Paul B. Cookran
White Sulphur Springs Hotel
Sulphur Springs, Pa.

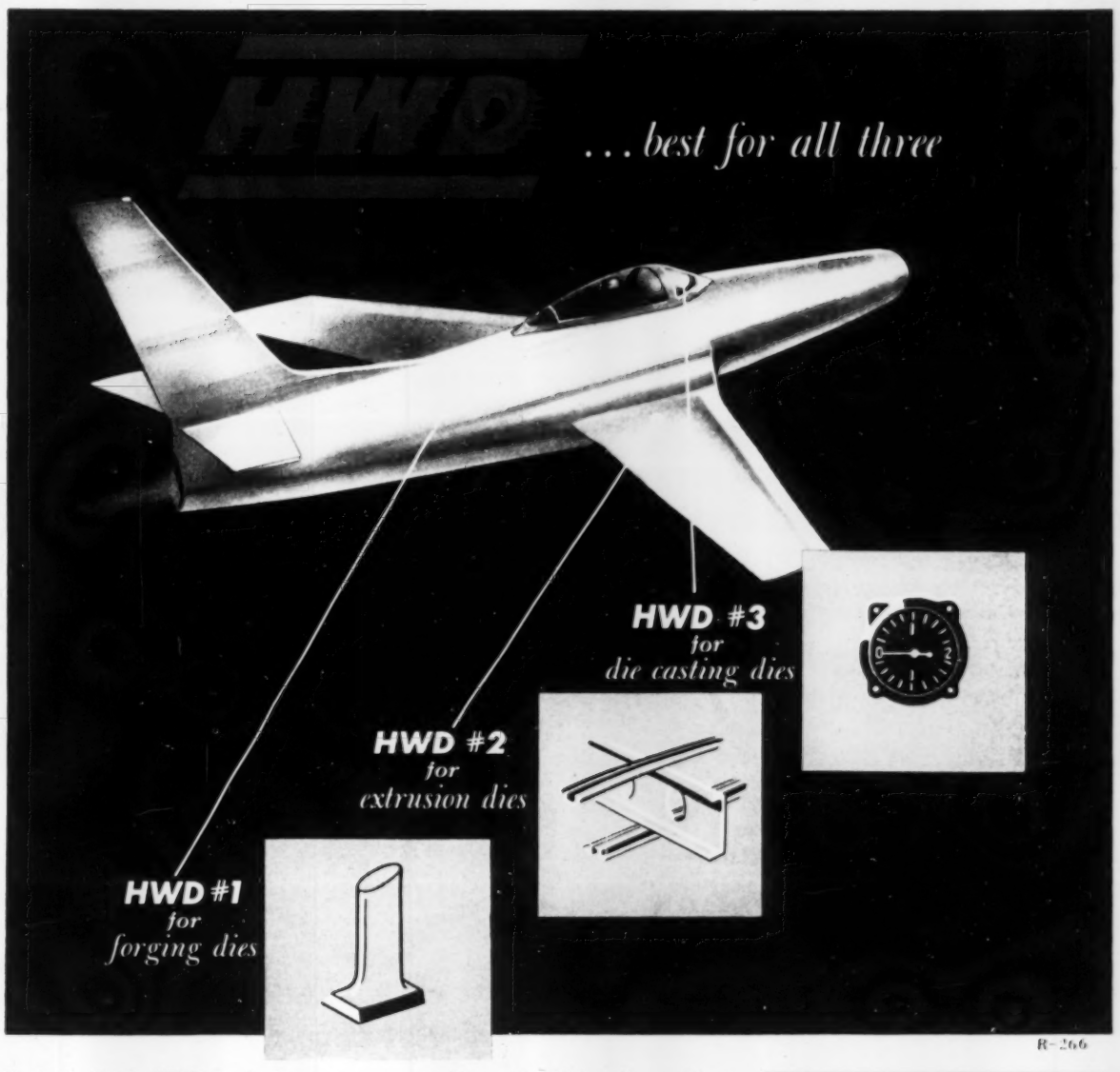
Proven Plastic Dies

On p. 90 of the Dec. 15 issue of STEEL you mention that there are three companies now making plastic dies and that six more will be making them shortly. We would appreciate it if you could send us the names of these companies so that we may contact them.

Frank Sebastian
director of purchases
Magna Engineering Corp.
Menlo Park, Calif.

• *The three makers of plastic dies referred to in the Dec. 15 issue of STEEL are located in the Detroit area. They are: Creative Industries of Detroit; Richard Bros. Division, Allied Products Corp. and Warren Plastics & Engineering Inc. We suggest you contact Rezolin Inc., Los Angeles supplier of the material from which these dies are made, for the names of die makers in your area who have had experience with the plastic.—ED.*

HWD ... best for all three



R-266

Firth Sterling's HWD steels, because of their versatility in forging dies, extrusion dies, and casting dies, are fast becoming the popular choice throughout the industry. Here are six very important reasons why:

(1) Longer die life is assured because HWD steels maintain their *hardness.*

(2) Cracking is greatly minimized because of HWD's exceptional *toughness.*

(3) HWD steels have real resistance to *"washing"* in die casting operations.

(4) A thorough series of *inspections,* including ultrasonic testing, insures the very best in top *quality* steel.

(5) Air hardening insures *minimum movement* in heat treatment.

(6) Balanced alloy composition provides exceptional resistance to *checking or cracking* when the steel is cooled by water.

HWD Comes in Three Grades

HWD #1 and #2 are essentially the same steel except that HWD #2 has no tungsten, giving it more resistance to thermal shock. HWD #3 is Firth Sterling's latest modification of HWD #2 and has a higher Vanadium content to increase the life of die casting dies.

FIRTH STERLING TRADE MARK

Firth Sterling INC

OFFICES* AND WAREHOUSES: HARTFORD NEW YORK* DETROIT CLEVELAND DAYTON* PITTSBURGH* CHICAGO BIRMINGHAM* LOS ANGELES PHILADELPHIA*

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

HYPRO features that lower unit costs___*broaden work range!*

G&L Double Housing Planers for extra-heavy and carbide tooling applications

These advanced features make G&L Double-Housing Planers the most modern development of their type for precision machining available anywhere.

Modern HYPRO planer construction shown here simplifies the most complex setups. It assures greater machine rigidity, accuracy and speed for extra-heavy applications and use of alloy and carbide tooling. Table widths — 36" to 120" allow full range of operations on both "normal" and massive size castings or weldments. Maximum feeds and speeds may be used regardless of amount of metal to be removed for rough and finish machining. Logical arrangement of all components, safety and operating controls assures smooth, convenient operation.

HYPRO planers have versatility to meet unusual production demands. To speed up overall operations, castings can be mounted in tandem. In this type of operation two rail heads and two side heads can be combined for multiple roughing cuts. This tandem arrangement saves tool set-up time . . . also insures precision alignment of bearing ways and accurate planing of all flat surfaces. This arrangement provides identical interchangeable work pieces.

Whether your work is simple or complex . . . large or small let these modern G&L HYPRO features work for you. Best way to find out how you can improve planing efficiency is to contact your nearest G&L representative. He'll tell you all about G&L's unbiased Job Analysis. Remember, there's no obligation . . . and DELIVERY ON G&L MACHINES MIGHT BE BETTER THAN YOU THINK!

Logical Grouping of Electrical and Safety Devices — assures most complete protection of machine and operator.

New HYPRO Pneumatic Tool Lifters — prolong tool life. Advanced cam and snubber design assure shockless tool block reseating without disturbing tool settings.

Patented Automatic Hydraulic Table Stop — protects against gear damage. Acts with a uniform decelerating motion without shock to planer in event of electrical or control failure. Eliminates "extras" — rack sections, cranes, etc.

Double-Length Enclosed Bed — extra depth through gear section for added strength, rigidity, smoother table travel.

GIDDINGS & LEWIS

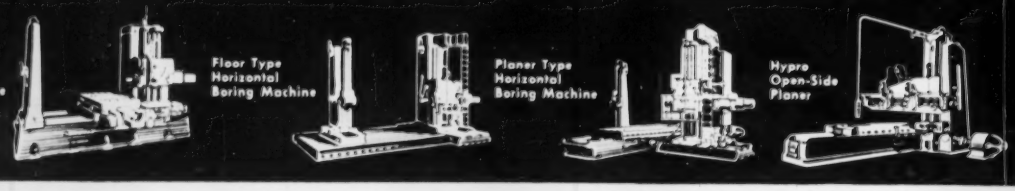
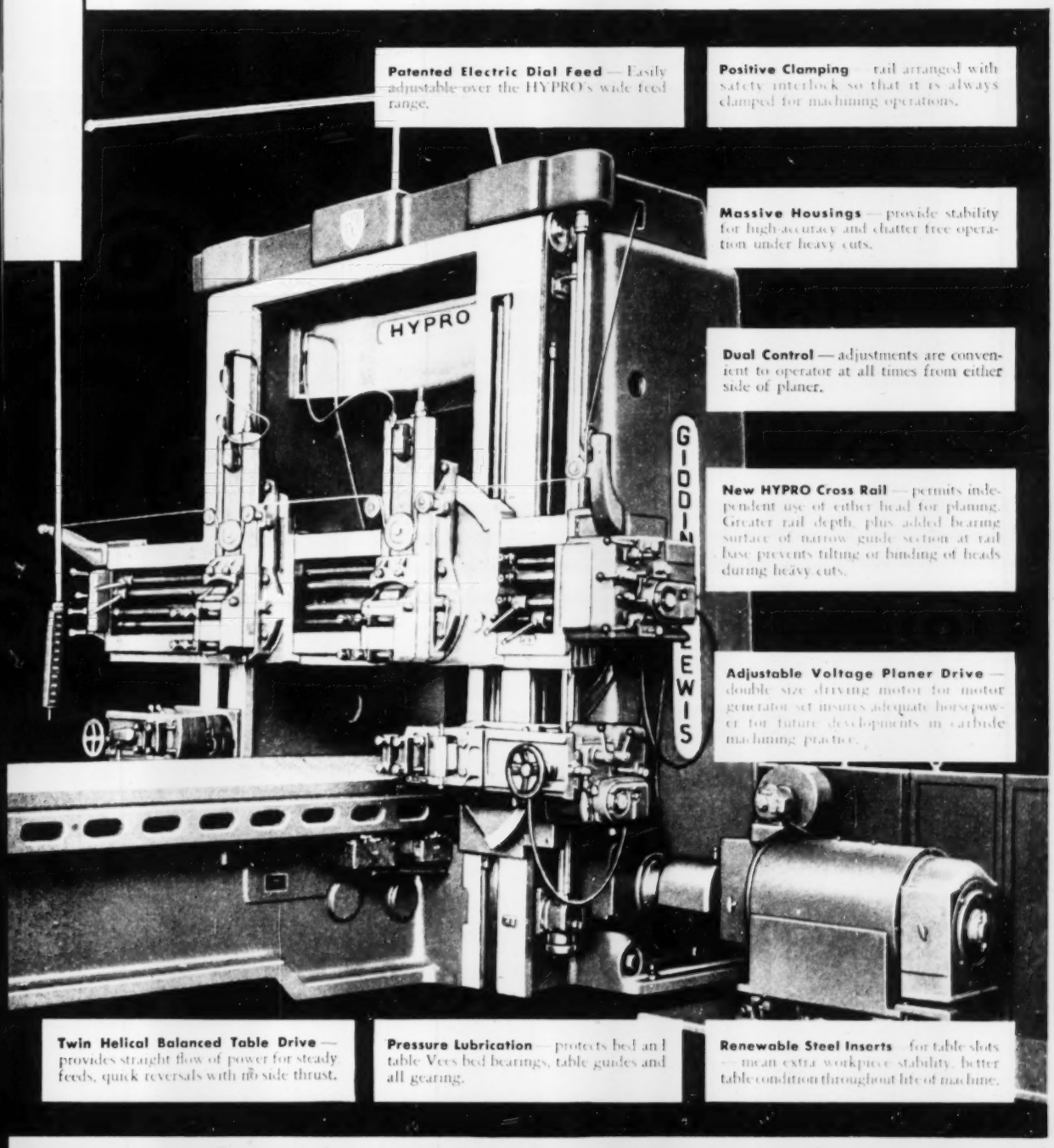


Table Type Horizontal Boring Machine
Floor Type Horizontal Boring Machine
Planer Type Horizontal Boring Machine
Hypro Open-Side Planer



Patented Electric Dial Feed — Easily adjustable over the HYPRO's wide feed range.

Positive Clamping — rail arranged with safety interlock so that it is always clamped for machining operations.

Massive Housings — provide stability for high accuracy and chatter free operation under heavy cuts.

Dual Control — adjustments are convenient to operator at all times from either side of planer.

New HYPRO Cross Rail — permits independent use of either head for planing. Greater rail depth, plus added bearing surface of narrow guide section at rail base prevents tilting or binding of heads during heavy cuts.

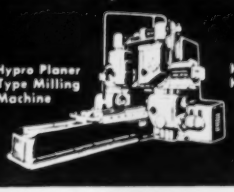
Adjustable Voltage Planer Drive — double size driving motor for motor generator set insures adequate horsepower for future developments in carbide machining practice.

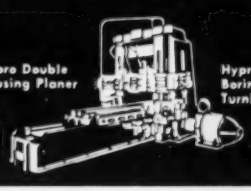
Twin Helical Balanced Table Drive — provides straight flow of power for steady feeds, quick reversals with no side thrust.

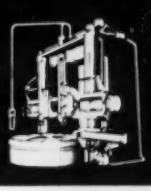
Pressure Lubrication — protects bed and table Vees bed bearings, table guides and all gearing.

Renewable Steel Inserts — for table slots — mean extra workpiece stability, better table condition throughout life of machine.

MACHINE TOOL CO.


Hypro Planer Type Milling Machine


Hypro Double Housing Planer


Hypro Vertical Boring and Turning Mill

G&L HYPRO

FOND DU LAC
WISCONSIN

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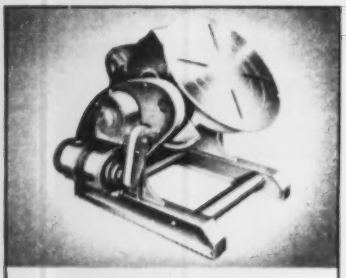
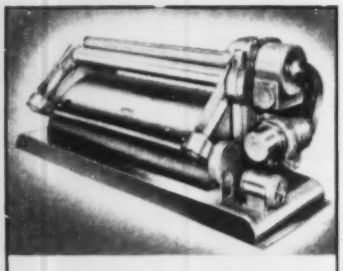
Modern Metalworking Equipment

- BENDING ROLLS
- TURNING ROLLS
- AUTOMATIC WELDING FIXTURES



REED WELDING POSITIONER

- ★ Machined face with cast-in "T" slots
- ★ Machine Tool accuracy
- ★ 10-to-1 speed variation
- ★ Ball bearing work table mounting
- ★ 1000, 2500 lb. models, hand or power tilting
- ★ Rotating ground connection



REED PLATE BENDING ROLLS

- ★ In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x ¼" in capacity
- ★ Rugged, all steel construction
- ★ Built-in, silent worm gear drive
- ★ Durable, special bronze bearings
- ★ Power adjustment & air drop end available on most models

WE INVITE YOU . . . to write us for specifications, prices, list of REED users near you. No obligation. Just write on your letterhead.

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HERE ARE THE FACTS on how Norton, as suppliers of the abrasives and abrasive products essential to every type of grinding, leads the field in volume, in variety, in facilities and in the constant research and pioneering that heighten the "Touch of Gold" for you and for all industry.

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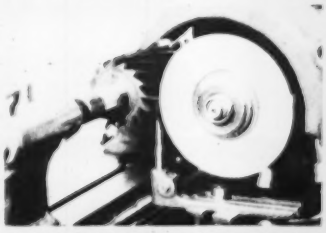
Abrasives and Bonds are microscopically examined under both plain and polarized light, in the Petrographic Laboratory.

Musical Pitch, or "ring" of a wheel is measured in the Physical Chemistry Laboratory, to determine certain characteristics.

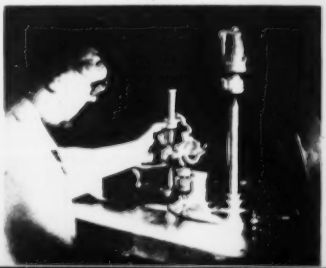
Constant Checking and testing of raw materials is one of the important functions of the Analytical Laboratory.

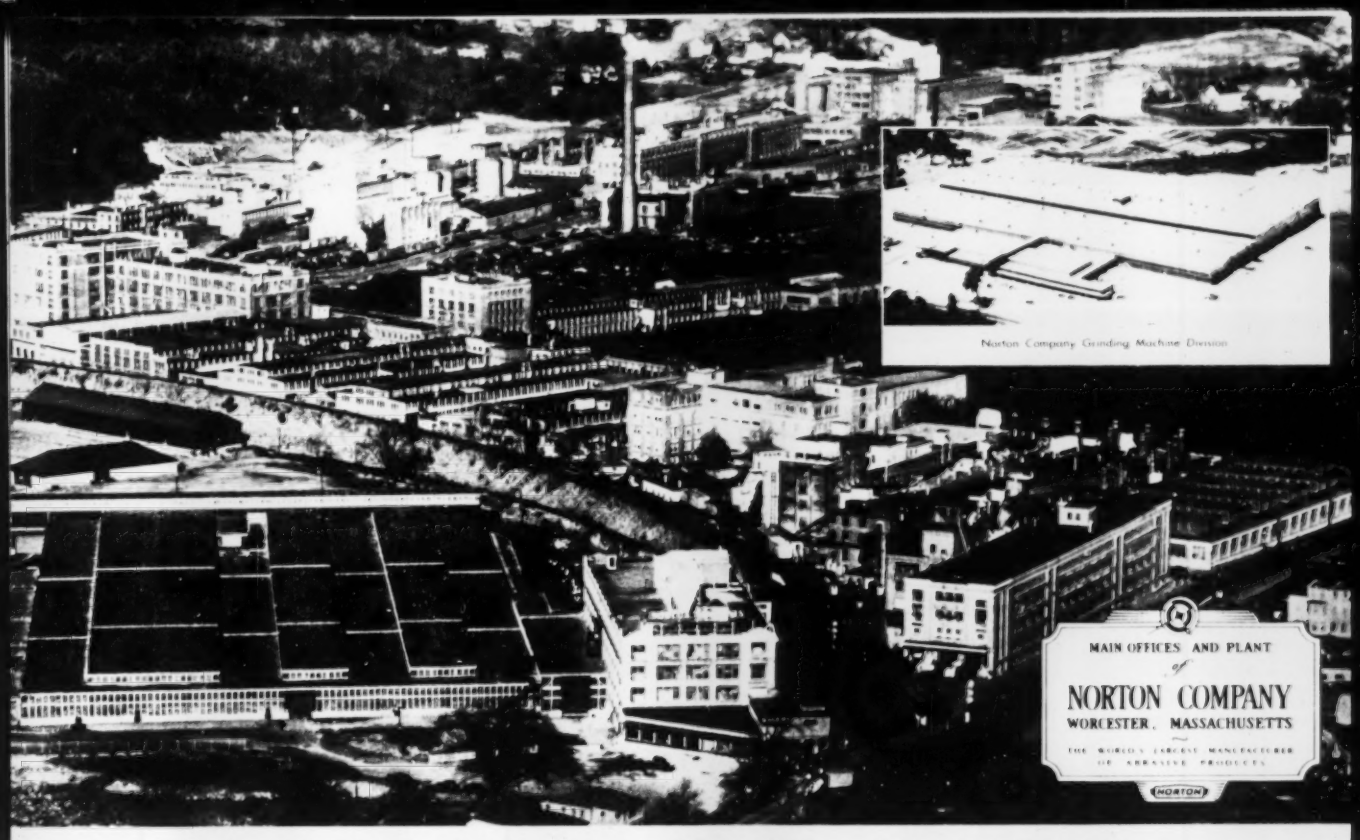
Norton New-Process Wheels are unequalled for uniform structure, identical performance and long, even wear.

32 ALUNDUM* Abrasive is a revolutionary Norton advancement. 32 ALUNDUM wheels cut both faster and cooler.



NORBIDE* Abrasive, hardest man-made material, replaces diamond dust in many lapping jobs, at fractional cost.





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More Products for Better Grinding . . . More Grinding at Lower Cost

Norton offers you the widest choice of abrasive products — all manufactured to strictest quality control standards — the quickest, surest way to the grinding results you want. Norton ALUNDUM abrasives and Norton CRYSTOLON* abrasives, together with Norton-developed bonds, make available hundreds of thousands of different grinding combinations, covering every known grinding requirement.

That's why you can always count on getting the *right* Norton wheels for every grinding job you do.

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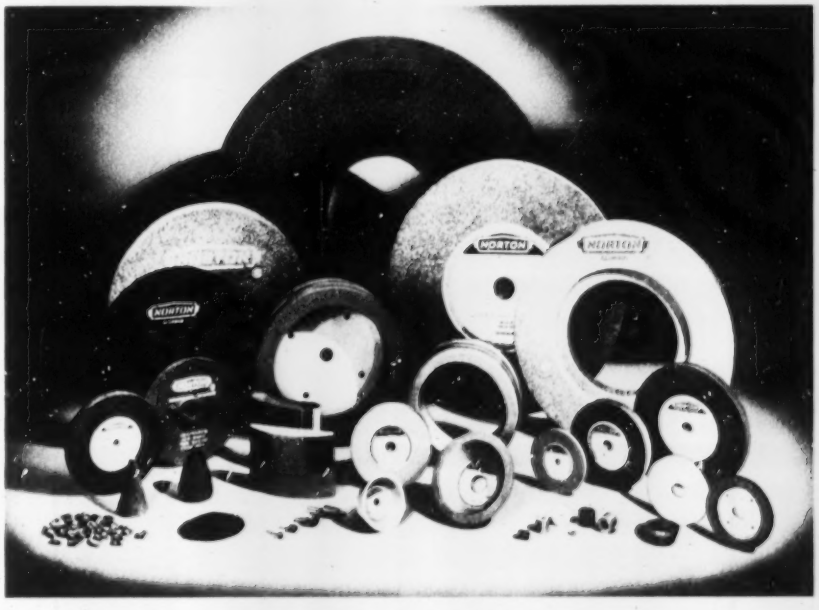
YOUR Grinding
Gets the Top
Value-Adding

"TOUCH OF GOLD"

with Norton Abrasive Products

For: Rough Grinding • Surface Grinding • O. D. Grinding • Cutting-Off • Polishing and Lapping • Tool and Cutter Grinding • Internal Grinding • Disc Grinding • Die and Mold Grinding • Barrel Tumbling



NORTON ABRASIVES

Making better products to make other products better

*Trade Marks Reg. U. S. Pat. Off. and Foreign Countries

and NORTON is FIRST in SERVICE, TOO

You've read how Norton makes exactly the wheels you need to put the cost-cutting, value-adding "Touch of Gold" into your grinding.

Here's how you can be sure of getting those wheels — whenever you want them, wherever you're located.

1. YOUR NORTON ABRASIVE ENGINEER is located conveniently near you. He's a trained technician, skilled in every detail of grinding wheel manufacture and application. And he's ready to go into your plant, study your grinding problems and help you find the money-making answers.

2. YOUR NORTON DISTRIBUTOR is your local, direct connecting link with the entire Norton organization. A topnotch, factory-trained grinding wheel man, with plenty of practical experience in everyday grinding problems, can give you valuable help in selecting the right Norton wheels. And you can always count on your Norton distributor for adequate stocks, selected to meet the particular needs of your area.

3. NORTON BRANCH WAREHOUSES located in Chicago, Cleveland, Detroit, Philadelphia, and Pittsburgh, are backed by the huge stocks at Worcester. Each of these stocks is a vital nerve center in the Norton distribution system — each is an additional guarantee that Norton Service matches Norton Engineering in bringing you the "Touch of Gold" that means more profitable grinding for you.

NORTON COMPANY

Worcester 6, Massachusetts

DISTRIBUTORS IN ALL PRINCIPAL CITIES
SEE YOUR CLASSIFIED TELEPHONE DIRECTORY

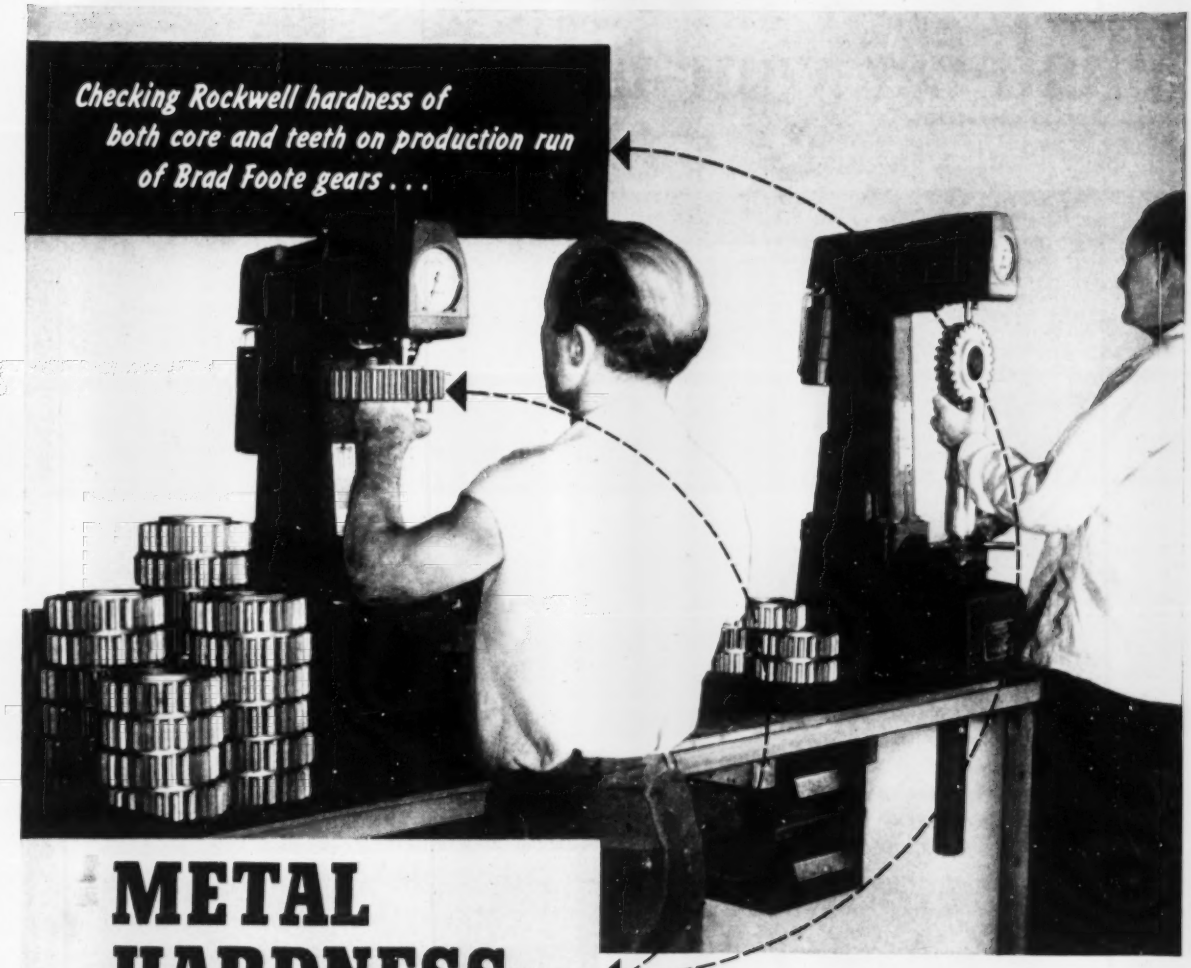
EXPORT: Norton Behr-Manning Overseas Inc., Worcester 6, Mass.

NORTON
ABRASIVES

Making better products to make other products better

12 52

Printed in U.S.A.



METAL HARDNESS

• Upon the correct metal hardness rests the length of life you can expect from the gears you use. Good gear making consists of more than meets the eye. You can see a bad job of machining, but you can't see that the metal is too soft or too hard—until the gears give trouble.

• Here at BRAD FOOTE we make sure of metal hardness. We hold to extremely close tolerances checked carefully on the latest and best hardness-testing equipment. Nothing is left to chance, and no one shares our responsibility. So, when you buy BRAD FOOTE gears for your own use, or for use on equipment you make for others, you know that they will give long, satisfactory service.

• BRAD FOOTE makes every type of gear, out of any type of material. BRAD FOOTE makes speed reducers, gearmotors, transmissions, and intricate power units. We would like to discuss your requirements and make recommendations, or quote on your specifications. We'll give you prompt service.

BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
Bishop 2-1070 • OLympic 2-7700

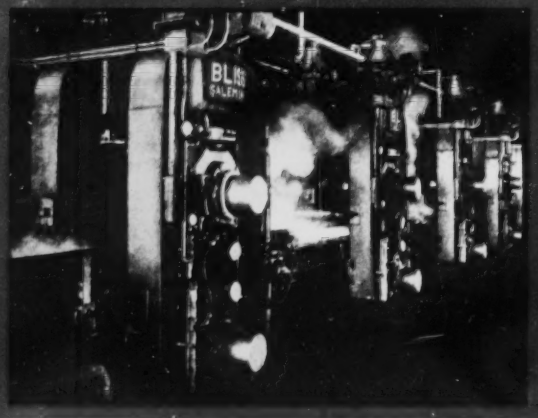
subsidiaries

AMERICAN GEAR & MFG. CO. — Phone: Lemont 920 — Lemont, Illinois

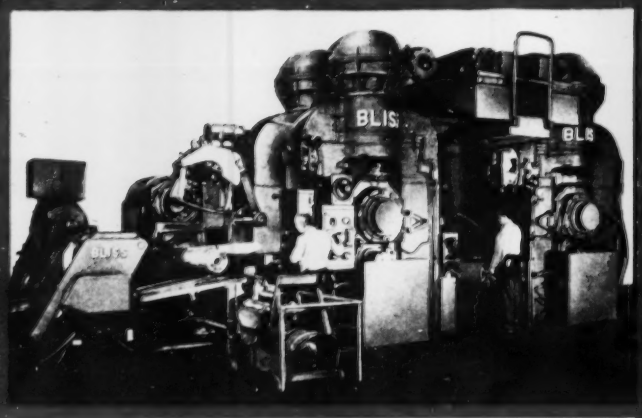
PITTSBURGH GEAR COMPANY — Phone: ATlantic 1-9950 — Pittsburgh 22, Pennsylvania

Whatever your metal-rolling job...

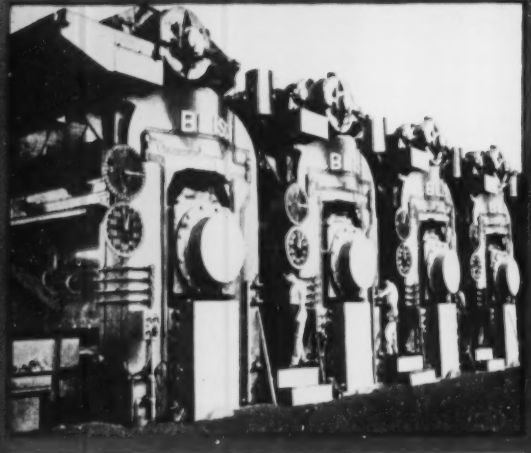
Hot..... Cold..... STEEL..... BRASS..... ALUMINUM.....



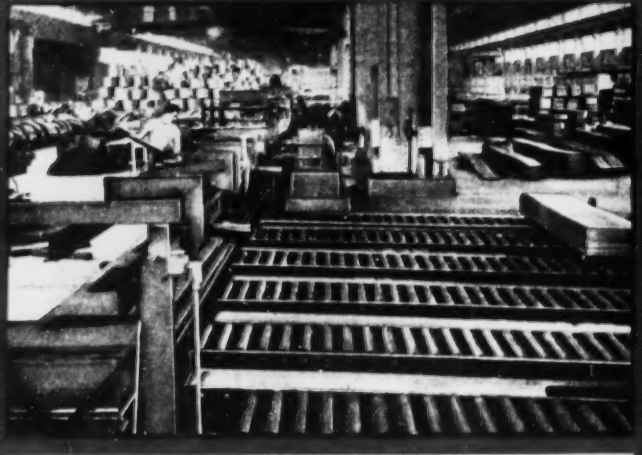
HOT-ROLLING STAINLESS · A Bliss 24", five-stand hot finishing train handles all the hot-rolling of stainless and "specialty" steels at Superior Steel Corporation. Since the thin stainless is slit into narrow strips, extreme accuracy and flatness are vital.



BRASS TANDEM · Brass and copper breakdown is the job of this Bliss four-high, two-stand tandem strip mill at the Springdale, Conn., plant of Stamford Rolling Mills Company. Bliss coiler, at far left, coils flat bars. Tension reel winds lighter-gage coils. A coil mandrel and elevator permit quick handling of heavy-gage coils.



HOT-ROLLING ALUMINUM · This five-stand, four-high 80" tandem mill hot-rolls aluminum sheet strip. Engineered and supplied complete by Bliss for a leading aluminum producer, this mill includes all necessary special auxiliaries such as roll brushers, guides and up coilers.



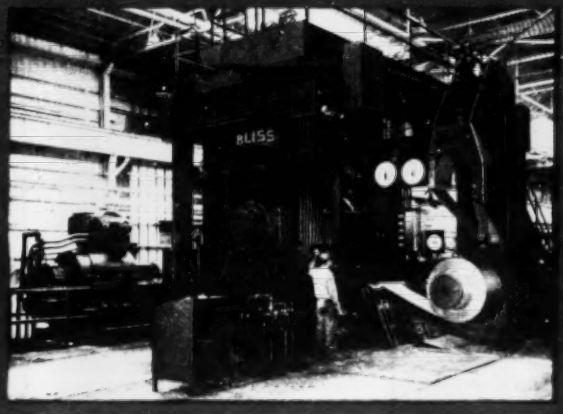
UP-CUT SHEAR LINE · Coiled steel is converted into uniformly flat sheet blanks at speeds up to 240 fpm by this shear line, designed by Bliss for Alan Wood Steel Company's 30" hot mill. The Bliss continuous shear line performs nine operations—from feeding to piling. It is suited for use in steel, brass and copper mills or fabricating plants.

Remember:

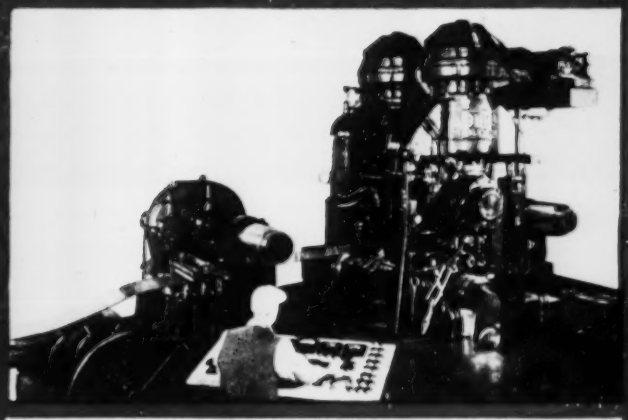
for Presses, ROLLING MILLS...

there's a BLISS mill to do it

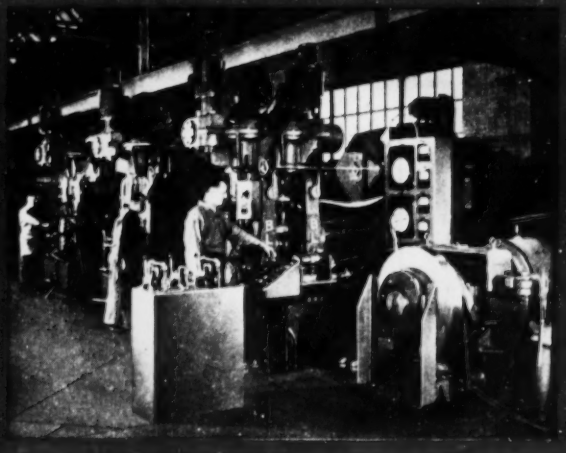
.....Breakdown.....Rundown.....Finishing.....



STEEL TEMPER PASS · Bliss four-high temper-pass mill, installed at the South's leading steel plant, rolled a record tonnage of steel in eight hours. Here, it tempers 20-gage steel at 3500 fpm, handles 30- to 13-gage, 20" to 48" wide. It handles sheet stock coils up to 72" in diameter



FOUR-HIGH REVERSING · This four-high reversing cold reduction mill, specially designed by Bliss, proved to be the answer to the Greer Steel Company's "varied" requirements—a rugged, versatile mill to maintain exacting standards for quality of finish and accuracy of gage on short runs and quick changeovers.



COLD-ROLLING STAINLESS · The steel plant for whom Bliss built this three-stand, two-high mill reports a 50% average reduction in a single pass; accurate cold-rolling and finishing of stainless and special alloys within .0005" overall; 'round-the-clock operation at speeds up to 600 fpm

For many, many years, the world's major metal-producing plants have specified Bliss rolling mills. Built for precision work at maximum speeds, Bliss mills take the abuse of continuous, high-speed operation with least possible maintenance.

Bliss builds a complete line of rolling mills and accessories for hot or cold rolling of ferrous or non-ferrous metals. Whatever your metal-rolling problem, you can look to Bliss for the right answer. Take the first step by writing for the Bliss 52-page brochure, including an extensive range of rolling mill machinery and many useful pages of engineering tables.

E. W. BLISS COMPANY
General Office: Canton, Ohio
ROLLING MILL DIVISION: SALEM, OHIO

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. **West Coast Representatives**: Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Co., Seattle. Other dealers in United States cities and throughout the world.

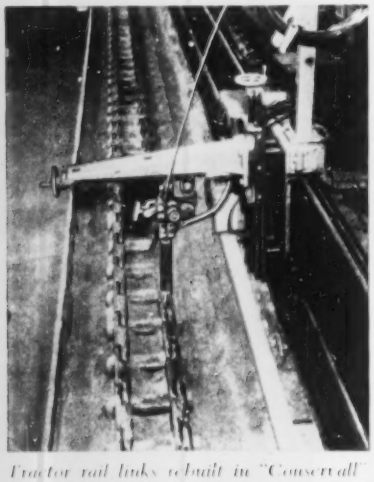
and Special Machinery..... IT'S BLISS

LINDE'S News of Metalworking

Worn Parts Rebuilt Economically by UNIONMELT Welding

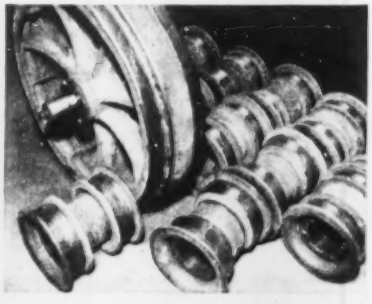
Repair of worn tractor parts is most practical and economical with specially developed fixtures on which standard UNIONMELT welding units are mounted. The metal deposited by UNIONMELT welding is so smooth that no grinding or finishing is required. Experience indicates that resurfaced areas will wear as long as new parts.

The Berkeley "Conservall" fixture is designed especially for rebuilding crawler tractor track links or rails without disassembling them. The track is placed in a trough and clamped in position. A LINDE side-beam carriage moves the UNIONMELT welding equipment over the positioned track and the welding of each link is automatically started, stopped, and accurately controlled. Rollers, idlers, sheaves, and other circular work can also be welded or resurfaced on another section of the machine.



Tractor rail links rebuilt in "Conservall" machine by UNIONMELT welding. Cams automatically control welding action for each link.

The "Leader" machine is also available for rebuilding both cylindrical and flat parts. Rollers are rebuilt on top of the machine. Larger parts, such as idlers, are mounted in the chuck at the side of the machine as shown. With the flat work attachment, parts such as disassembled track rail links, grousers, bulldozer blades, end bits and fabricated members can be resurfaced easily. This attachment is operated by a gear which is mounted in the chuck.



These tractor rollers and an idler were rebuilt at a speed of 30 in. per min. by UNIONMELT welding.

With both machines, the wheels can be tilted for rebuilding the flanges. It takes only 80 to 90 minutes to rebuild a D-8 track roller. Idlers take about three times as long.

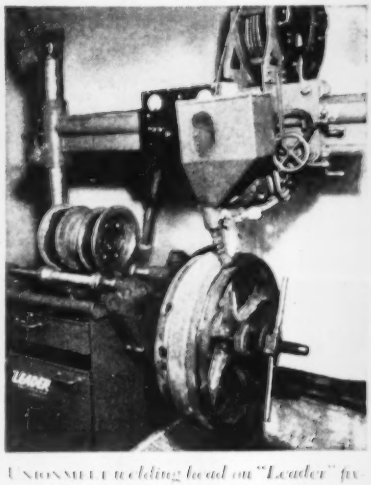
OXWELD 1928 rod is normally used in making these repairs. When wear is excessive, OXWELD 296 rod is sometimes used for the initial buildup which is then finished with OXWELD 1928 rod. For such resurfacing, use either Grade 80 or Grade 90 UNIONMELT welding compositions.

For some services, a finishing pass with a higher alloy tube rod is applied to produce a harder surface. While material of almost any hardness can be applied, one combining hardness and toughness lasts longer than one of higher hardness that tends to spall and chip. As deposited, OXWELD 1928 material has a hardness of about Rockwell C-25, but in service the working surfaces actually develop properties which cause them to outwear deposits that are substantially harder.

Advantages of UNIONMELT Build-up

UNIONMELT welded resurfacing is especially attractive with these automatic machines which readily permit deposit rates of 20 lbs. per hour. Savings in time and the advantages of a smooth uniform deposit justify the initial investment in automatic equipment. Important in these times is the conservation of metal realized with the process. The use of approximately *one hundred pounds of weld metal saves replacement of 2,000 to 3,000 pounds of new parts.*

LINDE'S engineers and technicians will be glad to give further information about UNIONMELT welding. Telephone or write today.



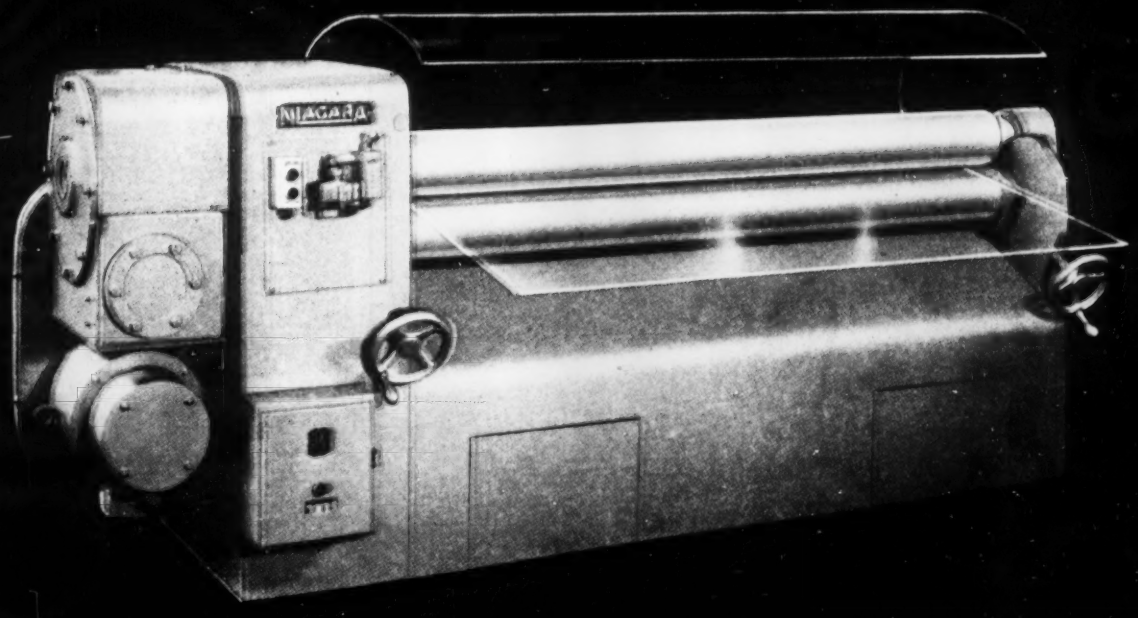
UNIONMELT welding head on "Leader" fixture rebuilds rollers and idlers. Rollers are welded on top of the machine, idlers at the side, and flat parts, depending on their size, can be welded on top of the machine or in the flat work attachment.

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

The terms "Linde," "Oxweld," and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

NIAGARA

ANNOUNCES



new all steel BENDING ROLLS

- Produces commercially true cylinders from thinnest sheets to maximum capacity.
- Rolls a multitude of bends in various shapes including oval forms, rectangular pipes, rounded end containers, cones etc.
- Pinch-type construction materially reduces flat spots on leading and trailing edges of work.
- All three rolls power driven permitting smaller diameters and easy operation with light gage sheets.
- Air operated drop end automatically tilts upper roll for easy removal of rolled cylinder.
- Power adjustment for rear roll saves time and effort.
- Roll position indicators allow operator to quickly duplicate roll settings for repeat jobs.
- Rapid reversal and positive jogging of rolls gives operator accurate control at all times.
- Magnetic brake on main motor prevents "drifting" of work, enabling operator to do accurate work without guessing.
- Unbreakable steel construction.
- No special foundation required.

6" Roll Series
Capacities 5/16"x 48";
3/16"x 72" and 12 ga x 120"

Write for new Bulletin 88

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK • PHILADELPHIA

Dealers in principal U. S. cities and major foreign countries

a few words about alloy steels

or... 3 x 3 = 1

one best answer to your alloy steel problem . . . one best answer supplied by the 3 members of Republic's 3-Dimension Metallurgical Service . . . the Field, the Mill, and the Laboratory Metallurgists . . . after looking at your problem from 3 angles . . .

First, what alloy steel or alternate grade will be best for your product . . . *second*, how to process the alloy selected on your present equipment . . . *third*, how to make the product best at lowest cost.

See what we mean by 3 x 3 = 1, when Republic 3-Dimension Metallurgical Service supplies the answer? A call to your Republic Sales Office will bring a Republic Field Metallurgist to hear your question.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic
REPUBLIC STEEL
ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

Why LINK-BELT belt conveyors are first choice in so many steel mills . . .

LINK-BELT engineering experience plus quality components combine to cut handling costs

Yes, in steel mills everywhere, Link-Belt is first choice in belt conveyors. Whether your job is large or small, Link-Belt can apply unequalled engineering experience to meet the conditions of your particular bulk handling requirements.

Link-Belt builds a complete line of quality components. Our conveyor engineers can choose from all types and sizes of idlers, trippers and terminal machinery to match your exact requirements.

Link-Belt can also supply all related equipment—other types of conveyors, feeders, elevators, car dumpers and shakers. And Link-Belt will build your supporting structures and enclosures . . . install the job completely if desired.

Link-Belt will gladly work with your engineers, consultants and builders of mill and process equipment. Get in touch with your nearest Link-Belt office.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities.

Magnetite ore is carried to the crushing plant on this 1500 ft. long belt conveyor equipped with 48 in. wide Link-Belt roller bearing idlers.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT Pre-Selected Terminals—the right equipment for every requirement

Terminal with single pulley drive

Terminal with screw take-up

Terminal with snubbed pulley drive

Terminal with counter weighted take-up

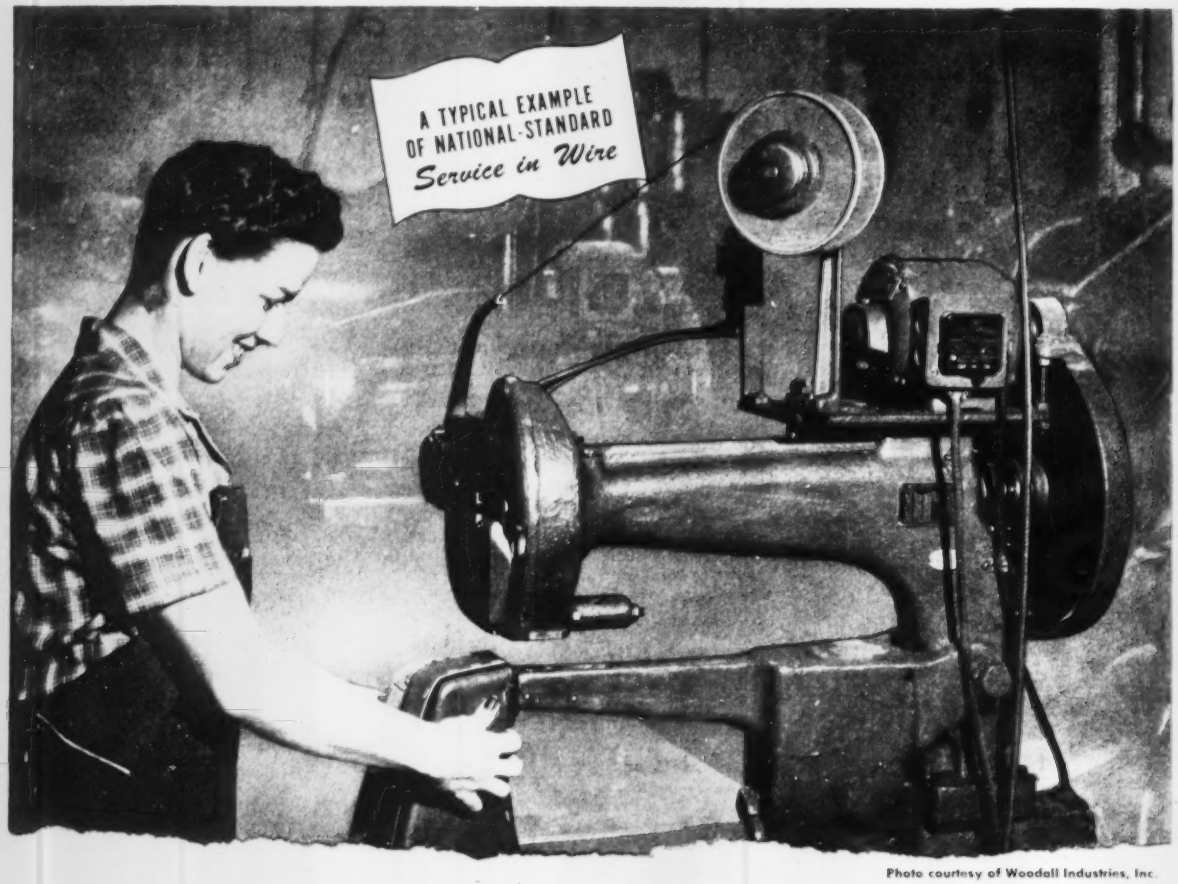


Photo courtesy of Woodall Industries, Inc.

A stitch in metal saves *plenty!*

STITCHING with wire is a relatively new way of joining metal to metal, or metal to almost any other material. Since speeds up to 100 stitches a minute are possible . . . and since wire is economical . . . there are tremendous time-and-cost savings compared with other methods of fabrication.

Success of the whole idea hinges largely on special wire. For the wire must be *stiff* to penetrate metal. It has to be *strong*, up to 330,000 psi in tensile strength, to provide a lasting grip. Still it must be *ductile* to take tight 180° bends without cracking or breaking.

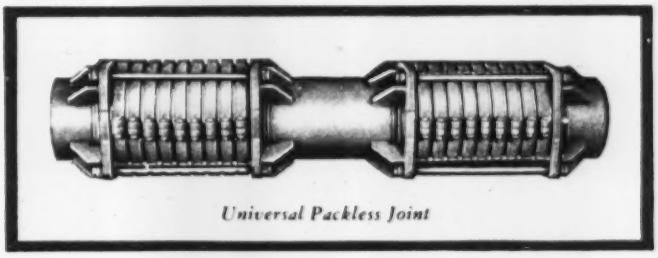
Here, at our Worcester Wire Works Division, this unusual wire is produced in several strengths, sizes and finishes to meet all metal stitching requirements perfectly! Here too, the skill and care for which Worcester Wire Works has long been known result in exceptional uniformity—a particularly great advantage for any user of machine-fed wire.

Do you have a problem involving wire? Perhaps, as in metal stitching, a new, specially developed wire is the answer. Maybe you need only some specialized engineering help on the use or fabrication of wire. In any case, Worcester Wire Works stands ready to serve you, to give you the advantage of engineering experience, special skills and techniques that have been over 50 years in the making. It's your standing invitation to out-of-the-ordinary, personalized service in wire.

NS
NATIONAL-STANDARD Company
NILES MICHIGAN

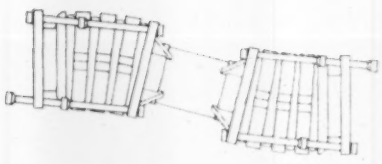
DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

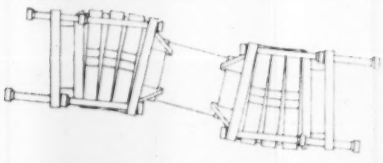


Universal Packless Joint

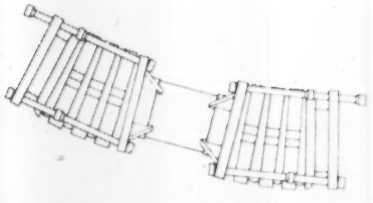
ADSCO Joint ...THE UNIVERSAL FAVORITE



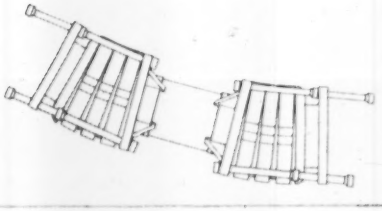
1. Absorbing lateral movement only.



2. Absorbing combined axial and lateral motion.



3. Angular rotation without axial motion.

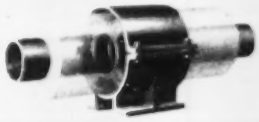


4. Combined angular and axial motion.

● When it comes to expansion joints, ADSCO is the universal favorite because ADSCO — and only ADSCO — makes a complete line of joints, both slip and packless.

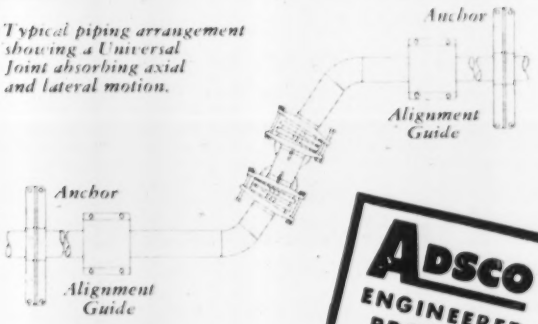
And if your problem is to absorb pipe line movement in all planes simultaneously, ADSCO Universal Packless Joints are the favorite . . . Often it is impossible or impractical to eliminate lateral motion or to isolate lateral from axial motion by anchors and guides. In these circumstances, the Universal Joint will reduce the number of anchors required and consequently reduce the amount of steel work necessary to support them. In Drawing 1 at the left, the Universal Joint is shown absorbing lateral movement only. By lengthening the intermediate pipe nipple the amount of lateral movement can be increased without increasing the number of corrugations. In this joint the tie rods take the place of anchors. In Drawing 2, the same joint is absorbing combined axial and lateral motion. Drawing 3 illustrates the joint in angular rotation without axial motion. Here again tie rods take the place of anchors. Drawing 4 shows combined angular and axial motion.

ADSCO can solve *any* of your pipe expansion problems. Call your ADSCO representative or write for Bulletin 35-51A.



● *For best results, use ADSCO Pipe Alignment Guides.*

● *Typical piping arrangement showing a Universal Joint absorbing axial and lateral motion.*



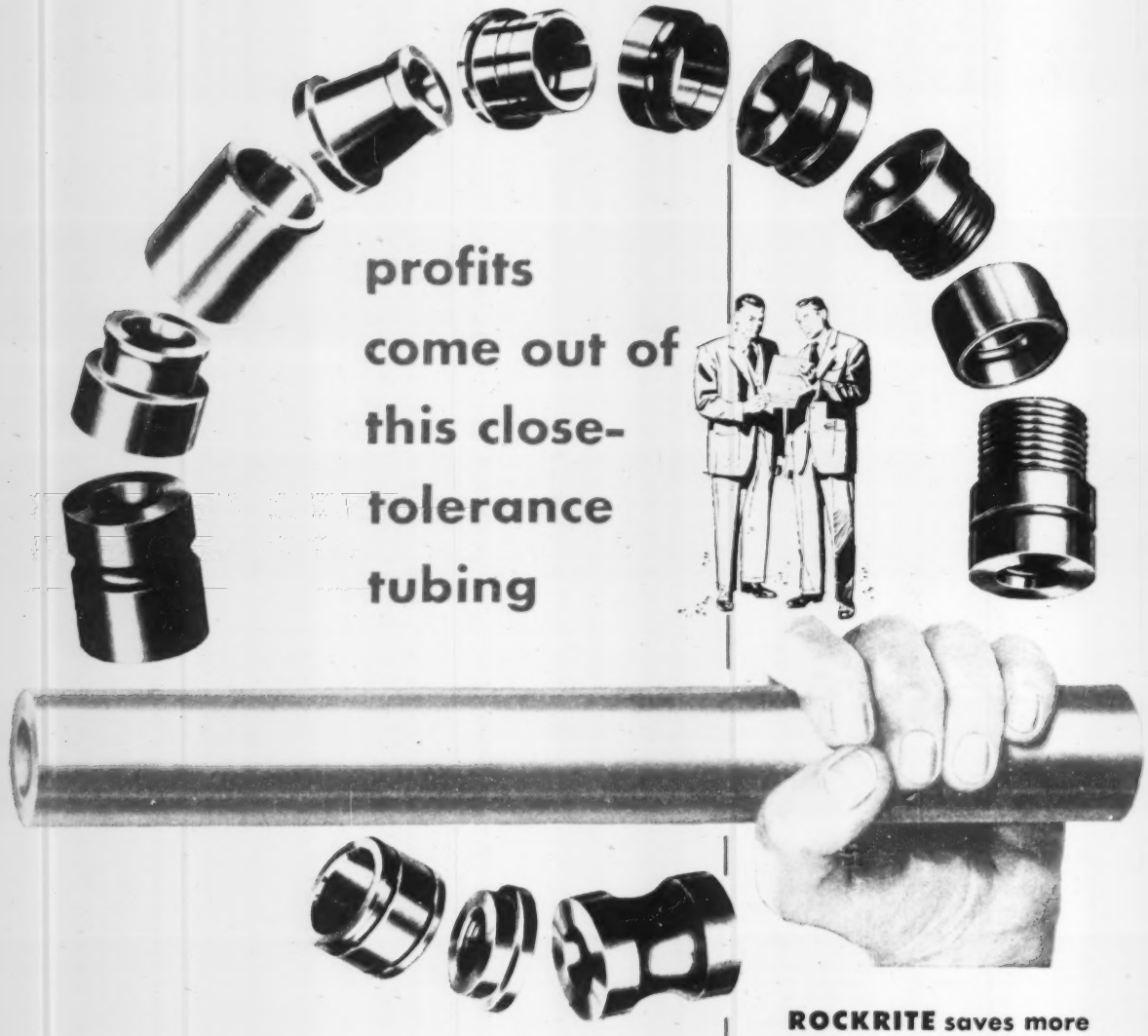
EXPANSION JOINTS • HEAT EXCHANGERS • STEAM TRAPS • STRAINERS • SEPARATORS • METERS

ADSCO ENGINEERED PRODUCTS

AMERICAN DISTRICT STEAM COMPANY, INC.

NORTH TONAWANDA, NEW YORK

Since 1877



profits come out of this close-tolerance tubing

Substantial savings are available to manufacturers who make ring-shaped and cylindrical parts of steel and certain non-ferrous metals. Machine-production of such parts has been doubled, total costs cut in half, and tonnage of steel purchased—in the form of tubing—reduced by some fifty per cent. All because Rockrite Tubing is sized by a totally different method—to dimensional accuracy very much closer than that considered standard.

Learn more about how close-tolerance Rockrite Tubing can step up your production, step down your steel requirements for quantity production of ring-shaped and cylindrical parts. Bulletin R2 tells the full metal-saving story. Write for your copy today.

Rockrite* cold rolled precision tubing is made only by Tube Reducing Corporation, the originator of the precision reducing process. You benefit by unequalled quality control methods.

*REG. U. S. PAT. OFF.

ROCKRITE saves more than any other tubing

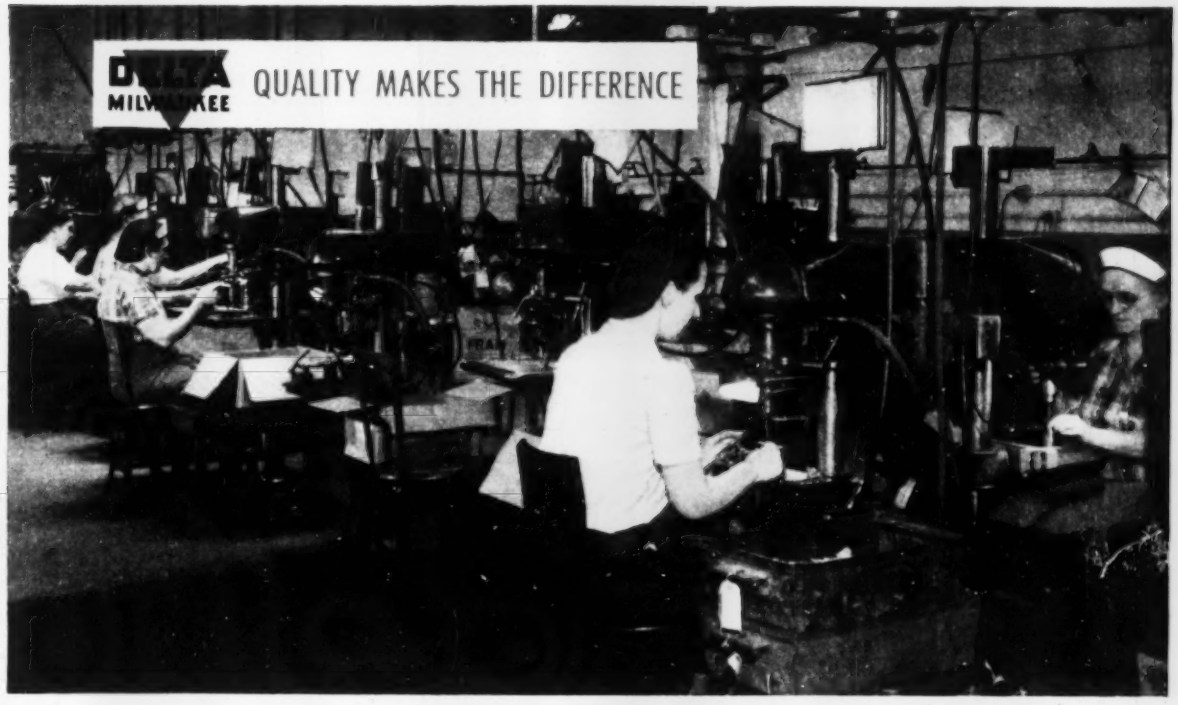
- *Higher cutting speeds*
- *Tools last longer between grinds*
- *Work-surface finishes are better*
- *Machined parts have closer tolerances*
- *Stations on automatics are often released for additional operations*
- *Extra-long pieces available — less downtime for magazine stocking and fewer scrap ends*
- *Closer tolerances often eliminate necessity for machining on outside or inside*

ROCKRITE TUBING

TUBE REDUCING CORP.

Wallington, New Jersey

TR 140A



18 Delta drill presses work interchangeably on several materials. Additional machines, set up ready for use, can be moved in and out of the line. Simple fixtures and Delta accuracy make jobs practically fool proof on machines that almost "run themselves."

Down Go Costs

WHEN ASTATIC CORP. PUTS **DELTA TOOLS** ON JOB

These Production Ideas Will Work for You, Too !

Here's how the Astatic Corp., Conneaut, O., manufacturer of microphones, radio, phonograph and television parts, gets high production and high precision at low cost with a shop full of Delta tools drill presses, grinders, metal cutting bandsaws, and abrasive finishing machines.

FLEXIBILITY –

Because Delta tools are light and mobile, Astatic takes them to the materisl, cutting handling costs; moves them, already set up, in and out of the production line as jobs change. Five different materials from steel to plastics are machined on the same Delta tools.

INTERCHANGEABILITY –

By standardizing on Delta, Astatic uses the same jigs and fixtures on several machines without adjusters.

FEWER SET-UPS –

By keeping machines set up for special jobs, one operator can tend several machines and do sequence operations. No waste motion. Because Delta tools are a low capital investment, they don't have to run constantly to pay out.

QUALITY –

Most of the Delta tools at Astatic have been on the job six to nine years with only routine maintenance proving that Delta gives you machine tool quality at a cost any production operation in your plant will justify.

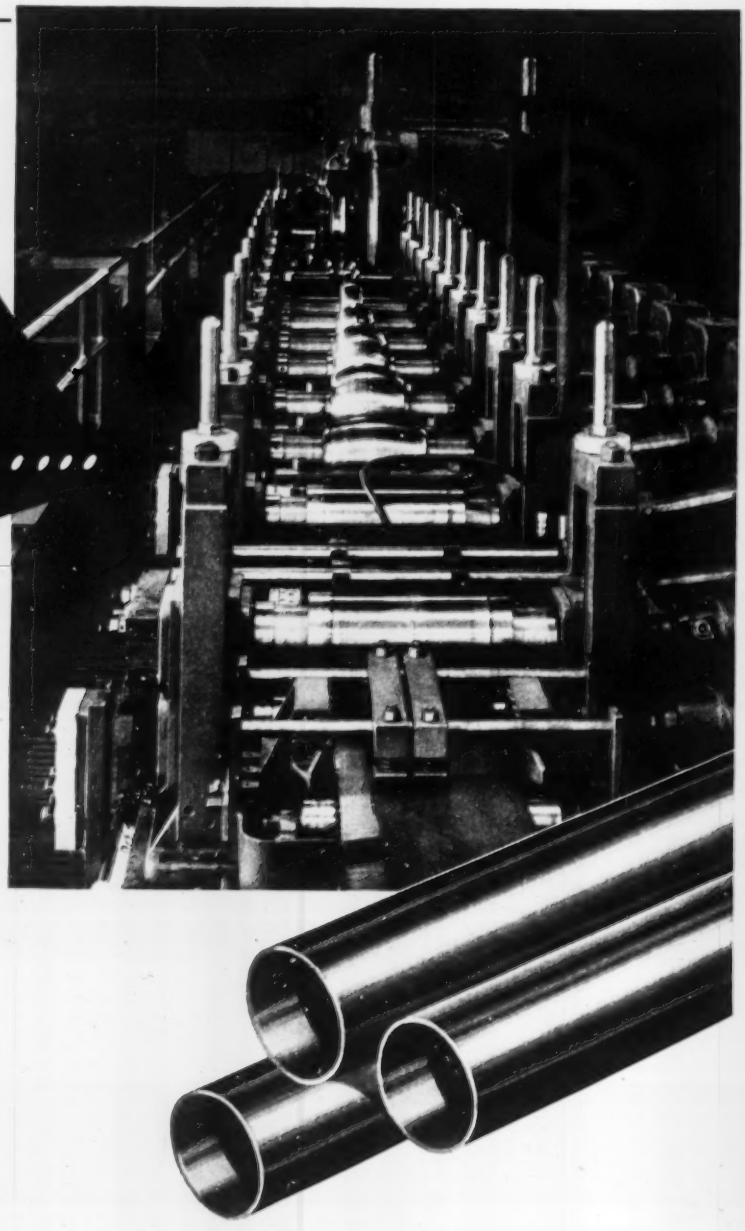
Do you have an up-to-date catalog of Delta tools? Call your Delta dealer. He's listed in your Classified Phone Book under "Tools", or write for Catalog AB, Delta Power Tool Division, Rockwell Manufacturing Company, 638A N. Lexington Ave., Pittsburgh 8, Pa.

DELTA QUALITY POWER TOOLS

Another Product by **Rockwell**

One of several **YODER TUBE MILLS** recently installed by leading Auto Manufacturers —

The Choice of a TUBE MILL ....



may be governed by a great many factors such as first cost, operating cost, speed, capacity, power consumption, etc. Mechanical and electrical features of the tube forming, sizing and welding units in themselves must be carefully examined. However, no matter how necessary or important all such details may be—or how effectively they may be presented—the most convincing proof of superiority is obtained by a comparison of tonnage production, consistently maintained over the years, of high quality tubes.

Fortunately, most electric weld tube mills are chosen that way. This fact, above all others, explains why the vast majority of such mills installed in the U.S.A. are built by Yoder.

List of Yoder tube mill installations sent on request. Also literature discussing the economics as well as the mechanics of tube making.

THE YODER COMPANY

5502 Walworth Avenue • Cleveland 2, Ohio

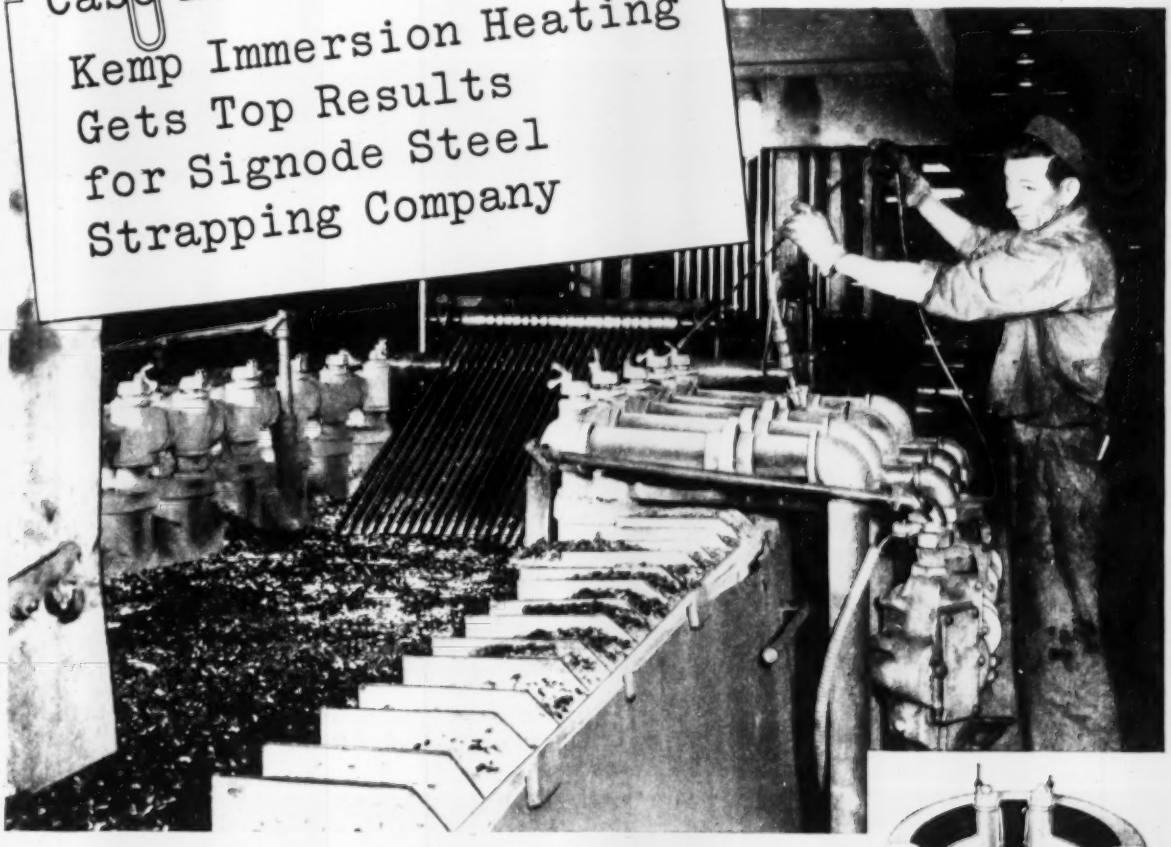
Complete Production Lines

- ★ **COLD-ROLL-FORMING** and auxiliary machinery
- ★ **GANG SLITTING LINES** for Coils and Sheets
- ★ **PIPE and TUBE MILLS**—cold forming and welding

ENGINEERING YODER MANUFACTURING

Case No. 42

Kemp Immersion Heating Gets Top Results for Signode Steel Strapping Company



How Signode Steel Strapping Co. tempers 650 feet of steel strap every minute

At the Signode plant in Sparrows Point, Md., turning out up to a thousand miles of steel strap daily calls for fast, efficient production line techniques. One highly important phase in the final processing is the tempering bath. Here, Signode called on Kemp Engineers to supply the 15 ton, gas-operated Immersion Melting Pot shown above. Now steel strap is uniformly tempered at the rate of 650 feet per minute.

Kemp Offers More Advantages

By installing Kemp Immersion Heating, Signode benefits in many ways. Unlike underfired pots, Kemp pots are *not* subject to *periodic* and expensive shutdowns . . . won't crack or break. They operate *continuously* at maximum heating efficiency with a *substantial* savings in fuel costs. Offer a greater heating surface, faster heat recovery, lower dross formation, even lower room temperatures. At the same time, this Kemp unit enables Signode to eliminate costly temperature override and open flame fire hazards.

Let Kemp Solve Your Problems

These same advantages apply to all types of melting or heating operations. Whether you are engaged in tempering, annealing, descaling, coating, etc., you can rely on Kemp Immersion Heating. Why not find out how Kemp Engineers can help you, save you money?

This 10 ton oval pot is typical of the many Kemp installations now in use. Features Kemp Carburetor, part of all Kemp equipment, to deliver complete combustion . . . without waste . . . without tinkering. One-pipe air and fuel feed reduces installation costs, simplifies maintenance.

For more complete facts and technical information, write for Bulletin IE 11 to: C. M. KEMP MFG.CO., 405 East Oliver St., Baltimore 2, Maryland.

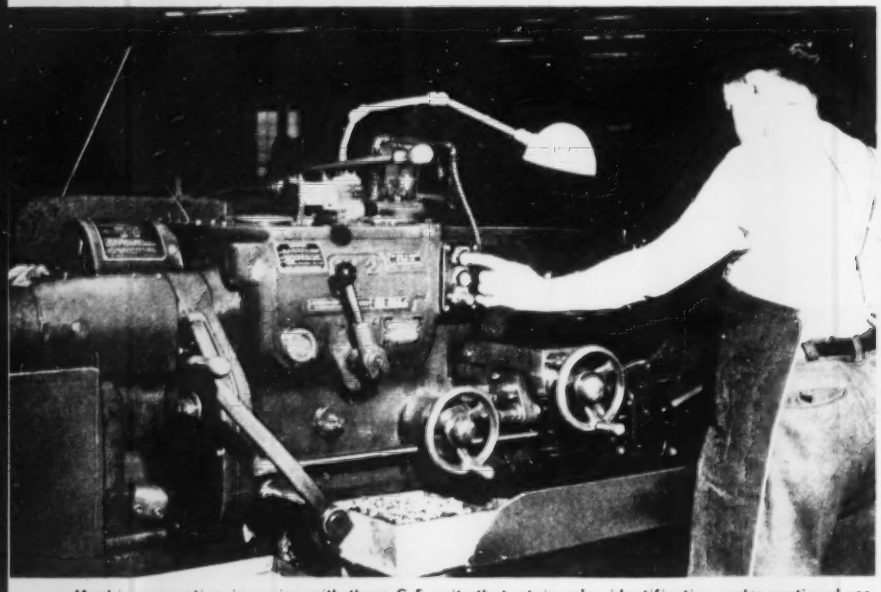
KEMP OF BALTIMORE

IMMERSION MELTING POTS

CARBURETORS • BURNERS • FIRE CHECKS
ATMOSPHERE & INERT GAS GENERATORS
ADSORPTIVE DRYERS • SINGEING EQUIPMENT

GENERAL-PURPOSE CONTROL

New G-E Oil-tight Units — Modern Design for Modern Machines



Machine operation is easier with these G-E units that retain color identification under continual use

An entirely new concept of push-button design means greater flexibility, easier installation, and longer life of these units on your machines.

VARIETY OF FORMS AVAILABLE

Interchangeable rings are available in five colors will fit both push-button and selector switch forms. No need to order complete units to get a special color. Operators are available with extra long button, mushroom head, locking attachment, cylinder lock, and in combination units in addition to the standard push-button and selector switch forms.

One basic form of contact block fits these operators; is attached by means of two screws. You save time and money in ordering or making up the forms you need.

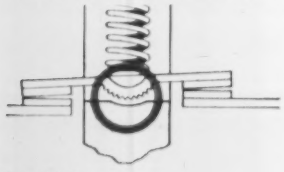
COMPACT ENCLOSURES

In stations or enclosures these units are back mounted simplifying wiring, and making a neat arrangement. Stations designed in accordance with JIC specifications are of strong, lightweight cast aluminum with a Buna-N gasket to keep out oil, water, and coolant.

BUILDING BLOCK CONSTRUCTION:

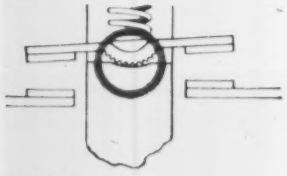
The same basic contact block is used on all push-buttons and selector switches. Double-pole, double-throw combinations are made by mounting two blocks on the same base. Tandem combinations with four contact blocks are easily made up by using an adapter plate. Write for Bulletin GEA-5779. *General Electric Company, Schenectady, N. Y.*

G-E SELF-A-LINE CONTACTS



ON MAKE:

When stationary contacts are misaligned movable contacts align with them.



ON BREAK:

Contacts always break evenly regardless of any misalignment of stationary contacts.

Wear is distributed evenly over both contact surfaces. Result: a 2:1 increase in life by actual load life tests.

LONG ELECTRICAL LIFE:

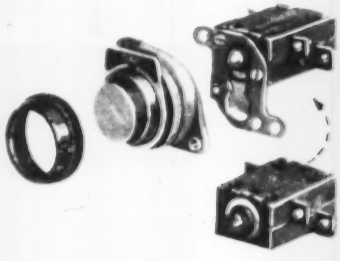
Unique self-a-line contacts assure equal distribution of arcing on the double-break contacts which prevents excessive and cumulative burning of the tips. Wipe on both normally open and normally closed contacts prevents false operation under vibration. Arc-resistant melamine contact block has long life.

ATTRACTIVE, BUT PRACTICAL:

Color stays clean and bright because it's anodized in the ring, and around the button away from area of use. Color coding can be seen from the side as well as the front. Smooth, rounded contour blends with modern machine design. Standard or extra-large nameplates available for all forms.

EASILY INSTALLED:

Contact blocks, operators and color rings can be assembled with little effort. Wiring is simple. Large pan-head No. 8 screws with terminal clamps easily take No. 12 wire and cannot be twisted off when tightened. Screw will also take solderless-type lugs. Only normal hand tightening is required to make unit oil-tight because of a special washer.



Inventory is reduced with these G-E units that have interchangeable color rings, separable operators, and one basic form of contact block.

INFORMATION FOR PRODUCTION AND MAINTENANCE

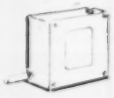
Reduced voltage starter

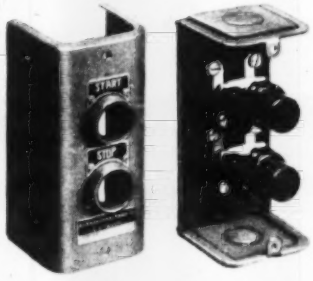
Heavy and standard-duty push-button stations

General-purpose relay

A-c and d-c solenoids

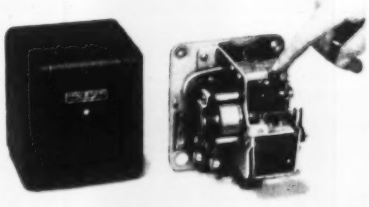
Roller-lever type limit switch


Rotating-type limit switch



HEAVY-DUTY PUSH-BUTTON STATIONS ARE VIBRATION RESISTANT—LONG LIVED

Enclosed in a strong steel case, G-E heavy duty units have silver-tipped contacts with strong springs that stand up under constant vibration and use. Many combinations are possible with momentary and maintained-contact buttons, selector switches, and indicating lights. Terminals are large for easy wiring. Large buttons encircled by guard rings prevent accidental operation. Surface and flush-mounted stations available. Bulletin GEA-5043 describes all forms.

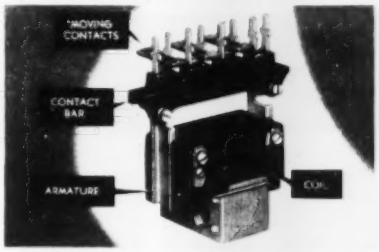


ACCURATE TIMING WITH THIS RELAY—STEPLESS ADJUSTMENT

For process timing this relay has a repeat accuracy of 0.5 per cent of maximum time setting. Four forms available for time ranges of 3 to 100 seconds up to 12 minutes to 6½ hours. Synchronous motor driven. Switch has both an instantaneous and time open time closed contact. For more information on this easily adjusted timing relay* write for Bulletin GEC-600.

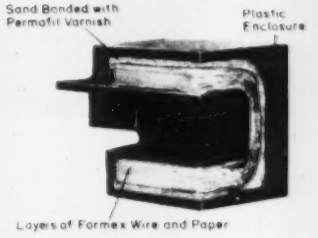
STRONGBOX COIL MEANS EXTRA LONG LIFE FOR G-E MAGNETIC MOTOR STARTERS

This unique plastic-encased coil resists moisture, dust, and oil—cannot be damaged by a slipping screwdriver during wiring and installation. Permafil* varnish, which does not liquefy in heat, prevents windings of Formex* magnet wire from abrasion under vibration and is sealed under vacuum so no "hot spots" can develop.



Coil acts as permanently lubricated guide to moving magnet. No metal-to-metal friction.

*Reg. trade mark of General Electric Co.



G-E Strongbox magnet coil has windings encased in molded plastic to prevent damage from vibration, moisture, dust, and screwdrivers.

The grooved sides of the plastic enclosure serve as guides to the moving magnet armature. A lubricant impregnated in the block reduces friction for fast, easy action at all times. There is no rubbing of metal against metal, so wear is reduced. Positive "make" and "break".

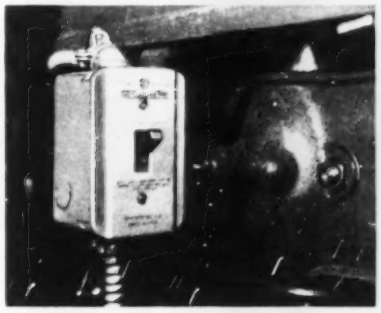
Wiring is easy. When the screw is backed off to make room for insertion of the wire, the clamps and lockwasher follow the screw head.

Coils are easily interchanged, come in ratings of 110, 220, 440, 550, and 600 volts. Simply remove four easy-to-reach screws, and the coil slips out over the stationary magnet. Design is simple, compact. Coil terminals are front-connected, clamp-type—solidly anchored in the plastic enclosure—will not twist loose when tightened on the wire.

Ask for the starter with the Strongbox coil—it's an exclusive feature of all G-E a-c full-voltage magnetic starters in NEMA Sizes 0 through 3 for one to 50 hp motors. Write for Bulletin GEC-880.

FRACTIONAL-HP MOTOR STARTERS HAVE EXTRA PROTECTION FEATURES

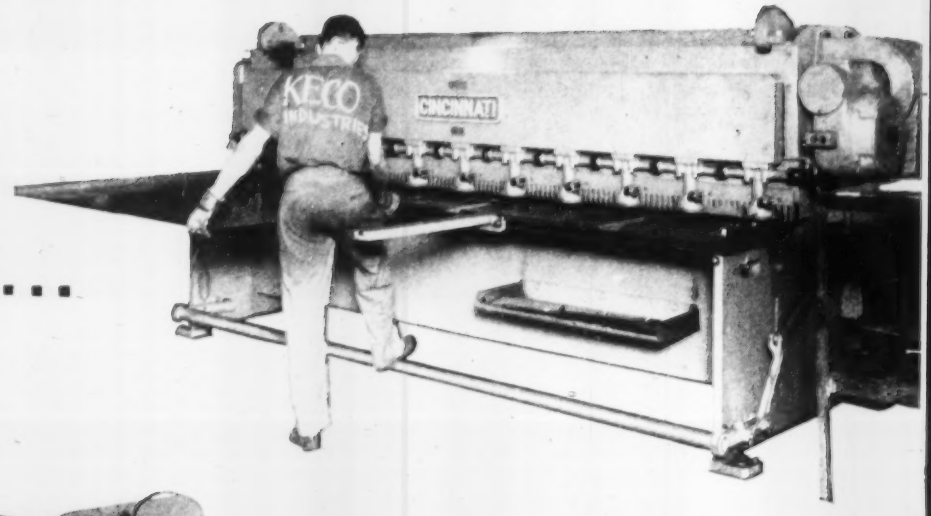
Bi-metallic overload relays take a variety of heater sizes—tab in operating handle quickly identifies rating. On overload, handle moves to OFF for position indication. Protection to contacts and overload relay is provided by a plastic enclosure within the steel case. The outer case has four ½-inch and two combination knockouts for easy mounting. Write for Bulletin GEA-2234.

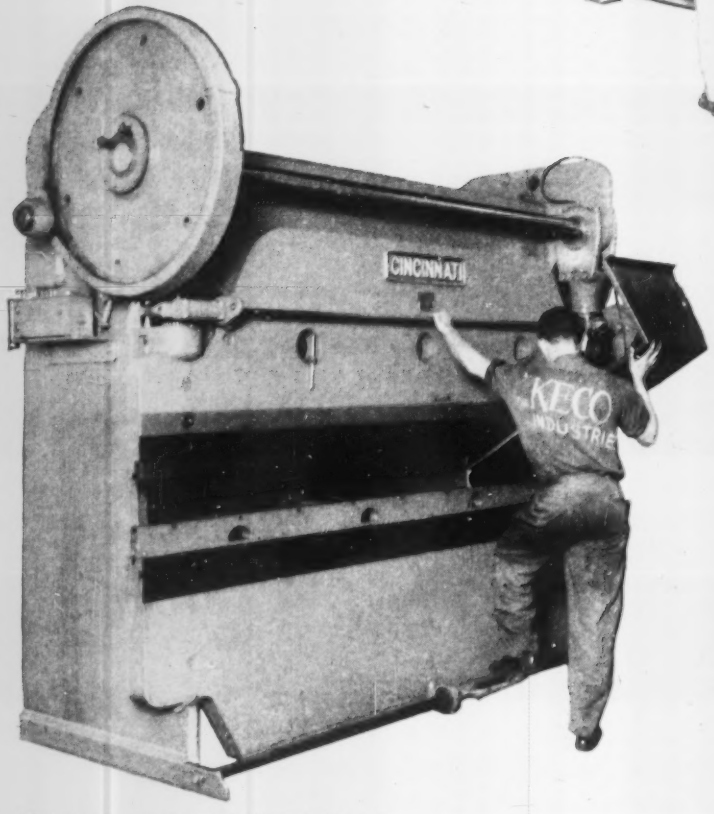


For more information contact your nearest G-E representative, agent, or distributor or write Section B 730-43, General Electric Co., Schenectady 5, N. Y.

GENERAL ELECTRIC

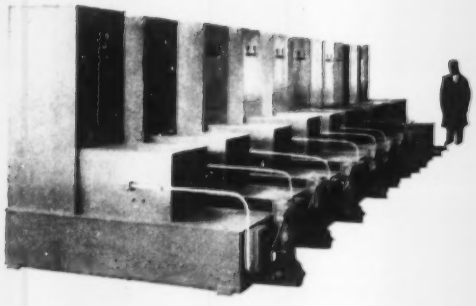
times as fast...





Photographs courtesy of the Keco Industries, Cincinnati 25, Ohio

with this CINCINNATI team



Cooling towers for portable air conditioning units

The floor-to-floor time consumed in shearing and forming panels for air-conditioning units, was cut from 12 minutes to 4 minutes at Keco Industries, using a Cincinnati Brake and a Cincinnati Shear.

Accuracy and rapid handling effected these savings.

In your shop, there may be opportunity for real costs reductions. Investigate Cincinnati Shears and Cincinnati Press Brakes.

Write for Cincinnati Shear Catalog S-6 and Cincinnati Brake Catalog B-3.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

The Metalworking Outlook

January 19, 1953

A Plan for Materials Decontrol

One of the first reports to reach Sinclair Weeks when he is officially on the job as secretary of commerce will be NPA and DPA recommendations on materials decontrol. The final study will probably recommend shelving the present CMP on July 1 and replacing it with a little CMP which would open-end steel, copper and aluminum except for priority assistance for direct military requirements, AEC needs and a few other programs.

Wages, Prices: No Advice

ODM Director Henry Fowler will allow no such specific recommendations to be made about wage and price decontrol. He is not happy at the way the White House meddled in those affairs even during his short tenure. He's going to remain quiet on those subjects and leave the problem strictly to the judgment of the new administration and the 83rd Congress. That's despite the numerous last-minute public pleas by OPS Boss Mike DiSalle to extend curbs beyond the present Apr. 30 expiration date.

Matter of Momentum

How soon can General Eisenhower and his staff get the wheels turning again? Activity in the defense agencies ground to a virtual halt last week and won't get going again until the new President makes basic decisions about decontrol, military procurement and many other matters. Lame-duck officials claim that even buying of some vital defense items will stop unless decisions are made by Feb. 1. As it looks now, few major decisions can be expected before mid-February.

$500 Million for Mobilization Base?

Action by Congress in approving President Truman's budget request for $500 million to create a mobilization reserve capacity "beyond current needs" would fill an important gap in the present powers of defense agencies. (For other aspects of the mobilization base problem, see p. 50). Whereas the defense agencies now have the power to procure machine tools and other industrial equipment for defense production, they do not have the authority, now possessed by the armed services, to spend government money for buildings for defense production. The $500 million request would give them that power.

The Last Word

Mr. Truman's last presidential message to Congress was an estimate that the nation would experience high levels of prosperity this year, but that we could hit economic storms further ahead, especially if the nation doesn't follow some of his policies and programs. Taking his figures from the annual review by the Council of Economic Advisers, Mr. Truman predicted that the nation could turn out $475 billion

Production Engineering News—p. 73 *The Market Outlook—p. 119*

to $500 billion in goods and services a decade from now, a gain of 40 per cent over present output measured in current prices.

Problems of Payment

The military stretch-out is bringing payment difficulties to many firms, especially smaller ones. Subcontractors who have already delivered items to companies holding prime orders on schedules that have been revised find trouble in getting their money. That's still another headache for which the new administration must find aspirin.

Industrial Trucks: Leased and Sold

The trend to lease, instead of sell, the more expensive capital equipment is gaining momentum. Yale & Towne Mfg. Co. and Automatic Transportation Co. have both just worked out plans to lease their industrial trucks through C.I.T. Corp., the industrial financing subsidiary of C.I.T. Financial Corp. Both manufacturing firms also have corollary plans for users of their equipment who wish to purchase it on installment terms rather than lease.

Shortage of Management Men

DuPont President Crawford H. Greenewalt says that growth in size and complexity of industry has resulted in a new profession, business management. But a pressing shortage of personnel for that profession threatens the future development of the country. He believes that new methods must be developed to get such personnel and to train them (p. 56). A difficulty in luring men into business management, in his opinion, is the current income tax situation.

Straws in the Wind

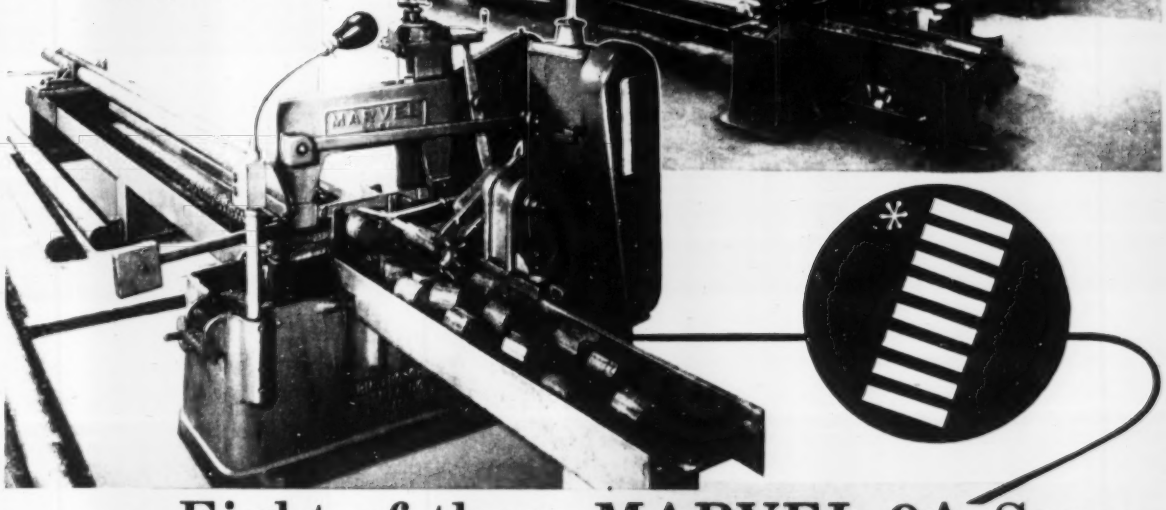
Pennsylvania Coal & Coke Co. has found a coal deposit in eastern Kentucky which produces coal ash rich in germanium, the rare metal with important electronic-controlling properties . . . Most members of the House Ways & Means committee predict the excess profits tax will be allowed to die June 30, and Rep. Daniel Reed (Rep., N.Y.) has introduced a bill to pare individual income taxes starting July 1. . . . Part of the new 2-million square foot, Navy-owned, Chrysler-operated jet engine plant in north Detroit will be used for guided missile research and development work . . . Increase in the J-40 jet engine contract between the Navy and Lincoln-Mercury Division of Ford Motor Co. will carry that engine's production well into 1955.

What Industry Is Doing

The probable labor picture for 1953: Few big strikes, many small ones, no pattern-making wage settlement (p. 45) . . . Makers of industrial furnaces are grappling with a severe manpower shortage (p. 46) . . . We are on the threshold of a new and mighty era in materials, power sources and fuels, is the consensus at the annual meeting of the Society of Automotive Engineers in Detroit (p. 47) . . . The future is bright for makers of light-duty circuit breakers (p. 48) . . . Sales of air valves reached a record $150 million in 1952 (p. 49) . . . American Iron & Steel Institute reports 93.1 million net tons of ingots were turned out in 1952, the third best year on record.

No. 9A MARVEL
Production Saws
Capacity 10" x 10"

No. 6A MARVEL
Production Saws
Capacity 6" x 6"



Eight of these MARVEL 9A Saws have already earned *Service Stripes**

Eight of these high speed MARVEL Production Sawing Machines at the Accuracy Steel Cutting Company, Hazel Park, Michigan, (a suburb of Detroit) operated almost continuously thruout the last war—cut up thousands of 20 ft. bars into accurate slices, pieces and lengths, for war production.

Now with a battery of fifteen of these world's fastest hack saws, Accuracy Steel Cutting Company has immense capacity to put behind defense and civilian work.

MARVEL Production Saws will automatically cut bar stock to size at terrific speed . . . they will feed, measure and accurately cut-off identical pieces from single or nested bars *automatically*, with no more operator attention than a battery of automatic screw machines.

Versatile, as well as accurate and fast, these saws can be stopped at any point in a production run—a miscellaneous cut made—and production resumed by simply re-engaging the automatic bar push up.

Write for Catalog

MARVEL *Metal Cutting* **SAWS**

ARMSTRONG-BLUM MANUFACTURING CO.

5700 Bloomingdale Avenue *"The Hack Saw People"* **Chicago 39, U. S. A.**

Do you agree with this stamping plant operator's version of "variables"?

DEPENDABLE DAN
® REG. U.S. PAT. OFF.

*Please do not confuse with "S H - R I P" That's our pet name for Sheet Steel cut into Strip widths, in coils or otherwise. Any Reliance "Dan" will gladly explain the difference. He'll also tell you about Reliance **Job-fitting** Service.

If you make stampings, tubing or roll-formed shapes, then perhaps you'll say "amen" to one stamping plant operator's version of variables in the pressed metal business:

> *"Life is just one pain-in-the-neck after another, licking variables in steels, tools and dies, machines, set-ups, even lubricants."*

Dies, machines, lubricants, etc. are out of our line. But on steel, we'll do the best we know how to select and supply as uniform a product as we have. That includes thickness, temper and also finish (when a factor). It applies to Hot Rolled and Cold Rolled Sheets as well as to Cold Rolled Steel Strip.

Accuracy and uniformity in steel depend on the *Tolerance Standards* applicable to each product. For example, in Strip*, the leeway for thickness is only about half of what's allowed, say, for Sheets. In Strip, you also have a freer choice of temper (*graduated* from soft to hard). And in surface quality, it's *either* bright or "satin"—and consistently so.

FOR HELPFUL ACTION CALL OUR NEAREST PLANT OR OFFICE

DETROIT STEEL CORPORATION

PRODUCERS OF
Coke and Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Manufacturers' Wire • Merchant Wire Products
Welded Fabric • Cold Rolled Steel Strip

GENERAL OFFICES
DETROIT 9, MICHIGAN

RELIANCE STEEL DIVISION
Processors and Distributors JOB-FITTED Sheet and Strip Steel

GENERAL OFFICES BOX 4308 PORTER STATION, DETROIT 9, MICHIGAN

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EASTERN PLANT, 2061 State Street, STate 7-5781, Hamden (New Haven 7), Conn.
MIDWEST PLANT, 1601 South Wolcott Ave., CAnal 6-2442, Chicago 8, Ill.

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DAYTON, OHIO, 120 W. Second Street, Michigan 8581
DETROIT 28, MICH., 13770 Joy Road, WEbster 3-5866
GRAND RAPIDS 2, MICH., 326 Keeler Bldg., GLendale 6-9569
INDIANAPOLIS 4, IND., 1509 Fletcher Trust Bldg., FRanklin 2333
JACKSON 18, MICHIGAN, 801 Reynolds Bldg., Jackson 4-6189
MILWAUKEE 10, WIS., 4622 W. Center St., HIlltop 2-1040
NEW YORK 19, N. Y., 250 West 57th St., COlumbus 5-4870
ROCHESTER 4, N. Y., 5 St. Paul St., BAker 1061
ST. LOUIS 8, MO., 4378 Lindell Blvd., LUcas 4550
TOLEDO 4, OHIO, 2114 Ohio Bldg., GArfield 8384
WORCESTER 8, MASS., 339 Main St., Worcester 5-8686

RELIANCE *Job-Fitted* PRODUCTS
COLD ROLLED STEEL STRIP and FLAT WIRE
Coils . . . Cut Lengths . . . All Tempers
SHEETS
COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED
Standard and Production Sizes or Cut to Actual Working Dimensions

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The Hard Way

Tomorrow's inauguration in Washington will be significant. It will be the first time in 24 years that the oath of office has been taken by a Republican President.

When President Hoover was inaugurated in 1929 the nation was enjoying prosperity. When depression hit, months later, Mr. Hoover and his party held to the belief that the powers of the federal government in respect to relief were limited. The depression became more severe and more prolonged than had been anticipated. Failure of the Republicans to meet this challenge squarely caused them to lose out in the elections of 1932.

Tomorrow General Eisenhower will take the oath of office as the 33rd President. He, too, begins his term in a period of prosperity, but there is a marked difference. In 1929 few persons detected clouds on the economic horizon. Today everybody knows that current prosperity is buoyed by defense requirements and inflation. Most persons realize that as defense expenditures decline support from other sources must be forthcoming; otherwise there will be a recession.

Ike and his associates know that if a serious depression occurs during their administration, their goose is cooked. They know they must maintain a reasonable degree of economic stability. They have pledged themselves to do it the hard way.

The easy way would be to continue the new deal and fair deal policy of borrowing from the future and relying upon wars and other crises to provide prosperity. This policy served the Roosevelt and Truman administrations admirably, but at a cost to the nation of an increase of $246 billion in the national debt, exorbitant taxes over extended periods and a loss of 49.6 cents in the purchasing power of the dollar. Despite this colossal cost, no acceptable cure for depression was found.

Ike and his teammates will try to develop economic stability on a sound basis. They seek methods whereby the American economic structure can stand on its own feet, without the support of war and without leaning upon the crutches of government assistance indefinitely. Should they succeed, they will have extended the horizons of opportunity for American enterprise tremendously.

E. L. Shaner

EDITOR-IN-CHIEF

RETURN TO BARGAINING: Among those who are speculating as to what turn labor relations will take in 1953, there is a feeling that most of the negotiating will be between employers and the unions and that the federal government will not attempt to meddle. President-elect Eisenhower is not-anti-labor and most of the members of his cabinet are fair-minded in disputes between employer and employees.

At the outset, at least, it is likely that the

new administration will be disposed to encourage a return to real collective bargaining, wherein the two principals sit around a table and try to resolve their differences without the aid or hindrance of a representative of the government. If the government is forced to intervene, it certainly will not act as a business agent for the union, as Mr. Truman so often did.

* * *

WELCOME REFINEMENT: In scanning the pages of this issue one will be impressed by the evidence that progress is being made in refining and simplifying specifications. An excellent illustration is provided by the work of Yale & Towne Mfg. Co. (p. 74) in developing a positive means of specifying surface finishes. A second and much broader example of a similar type of effort is found in the new cross index of chemically equivalent specifications, described by Dr. Allen G. Gray (p. 80), and which is the basis of this publication's new Specification Handbook.

The aim in the case of the specifications for surface finishes is to develop sharper definitions for various degrees of finish in order to minimize confusion. The cross index provides a reference by which the material compositions of certain ferrous and nonferrous alloys of different specification may be compared. The objectives in both of these undertakings are commendable and constructive.

* * *

PAPERWORK IS COSTLY: If there is any one gripe that is more widespread than others in the metalworking industry it is that the paperwork involved in supplying information to government bureaus is excessive, costly and often futile. The Automobile Manufacturers Association has completed a survey (p. 60) which shows that companies in the automobile industry devote one and a half million man-hours annually to the sole job of filling out forms for the federal government. This costs more than $5 million and it doesn't count the time spent on paperwork for the wage and price stabilization boards, nor does it count time and expense involved in trips to Washington.

If one were to prorate the experience of the automobile industry to that of all metalworking activity, or to all industry, the amount of effort directed to federal government red tape would be appalling. Here is something for the Eisenhower new broom to sweep up.

FAMILIAR DOUBLE TALK: Perhaps an outgoing President's messages should not be taken too seriously. Nevertheless, many persons probably read President Truman's annual economic report with curious interest. Written by his politically-minded economic advisers, it envisions "continued prosperity at 1952 levels for most, if not all, of 1953."

Its straight-faced precepts for business and labor are worthy of note. Business leaders are advised by the economic council to cut prices and increase sales efforts. All businesses should "experiment, carry on research, plan ahead, canvass markets for current and new products and explore the less developed areas of the country. Business should squeeze profits now to assure better profits later. Workers should not demand greater wage increases than are justified by increased productivity, or where wages are out of line."

All of which is going to prompt some wag to ask, "When in recent years did any government agency make an honest effort to limit union demands to those 'justified by increased productivity?' "

* * *

FORESEES ATOMIC ERA: Engineers and others who attended the annual meeting of the Society of Automotive Engineers in Detroit last week came away with a strong conviction that industry is on the threshold of a mighty new era. One of the developments that will dominate this period is atomic energy. Walter L. Cisler, president of Detroit Edison Co., declared (p. 47) that industrial applications of atomic energy hold as much or more promise for revolutionizing life as has the development of the automotive industry.

He believes that the really great possibilities of atomic energy lie in the industrial use of this new source of heat energy and he strongly urges changes in the law that will enable private industry to participate in its development. "Without the full participation of industry," he says, "the atomic energy development cannot move forward rapidly on a broad front."

Steel-Service Team

In there -- Pushing

Now more than ever the help of an experienced steel-service organization is especially valuable. That's why it may well pay to get in touch with the nearest Ryerson office or plant.

Not that we can *always* furnish the steel you need—much as we would like to, and hard as we try. But, with controls relaxing a little and a few steel products coming into better supply, there are more opportunities for experience and ingenuity to take over. And experience, ingenuity—and the will to help are never in short supply at Ryerson.

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Labor Highlights for 1953

The probable picture: Few long strikes, many small ones, no pattern-setting wage settlement. Labor will concentrate on consolidating gains, getting whatever it can

THE NEXT five or six weeks will be testing time for big unions.

They'll watch to see what the new Congress and President do on labor matters, and they'll see what management does about the trial balloon Walter Reuther is sending up by asking for revised contracts from auto companies before next Mar. 1. (For details on that situation, see p. 59). Using the government's new cost-of-living index, Mr. Reuther is seizing the technical problem of the changeover from the old index to the new as an excuse to broaden the talks to other matters. The auto contracts aren't supposed to come up for a general reopening before May 29, 1955.

In the Balance—If proposed labor legislation appears punitive, if President Eisenhower appears strongly anti-labor and if automotive management appears markedly quiescent, big labor will probably decide on a get-tough policy that will make 1953 a wild year. But none of those "ifs" is likely to materialize.

The Republicans are realists, and labor legislation will probably be conciliatory. President Eisenhower is for the laboring man, but against the pressures from labor chiefs. He'll try to withdraw from labor matters as much as possible, allowing the old routine of union-management bargaining to be resumed. Have the two forgotten how to bargain in the old way? Odds are the talks in Detroit will indicate that they have not.

How It Looks—If the "ifs" are disposed of favorably, the general labor picture shapes up this way for metalworking in 1953:

Wages—No pattern-setting wage settlement will take place this year. Unions will always ask for a lot more money and they'll get it in scattered cases, but the trend will be for small, token increases, with the hard bargaining coming on other matters, especially in negotiations involving small and medium companies. Unions know wage increases will be fought tooth and nail in the next 12 months.

Annual Improvement Factor — That aspect of the General Motors-type agreement is gaining popularity among unions. Evidence is the current demand of 21 co-operating railroad unions for productivity raises of 6 cents an hour annually. If you don't already have an improvement clause in your contract, union representatives will fight hard for it this year. The escalator arrangement, the other feature of the General Motors-type agree-

ment will be de-emphasized this year by most unions except the United Auto Workers, whose pet it is.

Guaranteed Annual Wage — Unions will talk more about it in 1953 than they ever have before, but they'll drop the matter once negotiations get down to brass tacks. It'll be a hot topic in 1954.

Social Insurance, Pensions—If you have them already in your contract, expect demands to liberalize your arrangements. If you don't have them, unions will try hard to win something, if only a token.

Other Issues — If unions can't get anywhere on the above issues, they'll start on the hundreds of other matters an extra holiday, shift premiums, changes in increments between worker classifications, etc.

The Big Ones—Various metalworking contracts will be expiring on almost every day of the coming year. Besides the automotive negotiations, these other two talks will be especially important. General Electric Co. meetings with the CIO's United Electrical Workers which can be reopened on wages only by Mar. 15, and steel wage parleys that are certain to be reopened May 1 and almost certain to be settled before the deadline of June 30.

One observer characterizes coming labor negotiations as "Operations Nag." He says: "There will be little that's big, just a lot of seemingly small adjustments."

The Catch? — The "seemingly small adjustments" may turn out to be surprisingly expensive. At the U. S. Chamber of Commerce's National Industrial Relations Conference in Cleveland last week, Richard F. Doherty of National Association of Radio & Television Broadcasters declared that "fringe benefits and fringe payments already equal 20 per cent of the nation's direct payroll costs," or $700 per employee per year.

No long, but many short strikes will characterize this year. The total number of man-days lost will not equal the 55 million lost in 1952 as a result of walkouts, but the total will be surprisingly high because all indications now are that management will take a stand this year and hold it.

C. H. VAUGHAN
. . . elected IFMA president

Matter of Manpower

Industrial furnace makers report manpower, not materials, curbing output today

MANPOWER is causing the most serious disruption of production in the industrial furnace manufacturing industry. Engineers, draftsmen, designers and other skilled workers are often drafted or lured to other industries.

Materials are virtually no problem, industry representatives reported as they convened Jan. 12 in Cleveland for the midwinter meeting of the Industrial Furnace Manufacturers Association whose members last year did $120 million worth of business.

Below Par Hurt — Inability of heating equipment makers to establish the essentiality of their industry in the early days of the defense effort resulted in serious delays in production, association members were told by L. A. Shea, NPA representative. Thus a prime contractor who received high priority machine tools still cannot get his production line going until he has the heat treating equipment needed for that production.

Furnaces from World War II stored at many different depots throughout the country are little used in defense production. Furnace men feel that some procedure should be adopted for disposal of this surplus, much of which is rapidly deteriorating.

Salvage—It may be possible to rehabilitate some of the equipment for further use. If not, transformers, temperature controls and nickel component parts should be salvaged and made available to the furnace industry.

Furnace association members approved a new set of by-laws, chose C. H. Vaughan, Electric Furnace Co., Salem, O., president. Also elected were L. H. Gillette, Westinghouse Electric Co., Meadville, Pa., vice president, and R. E. Whittaker, Swindell-Dressler Corp., Pittsburgh, treasurer. New headquarters of the association are 412 5th St., N. W., Washington, D. C.

Giant Ingot Poured for Press

A giant 275-ton ingot for the first of six columns required for an Air Force 50,000-ton die forging press was poured by Bethlehem Steel Co., Bethlehem, Pa. Two open hearth heats were poured without interval to fill the 18-foot high, 9-foot diameter ingot mold.

Departing from the conventional one-piece cylindrical column design, each column in the new press will be rectangular and fabricated of three rectangular forgings up to 110 feet long. The assembled press standing ten stories high will be installed at North Grafton, Mass., on a concrete foundation 100-feet deep already constructed by Loewy Construction Co., New York.

Inland Pours 80-Millionth Ton

Inland Steel Co. poured its 80-millionth ton of steel, Jan. 15, says Hjalmar W. Johnson, vice president at Inland. The 80-millionth ton was poured from one of four newly completed open-hearth furnaces at Inland's Indiana Harbor works.

Those four open hearths, put into operation late last year, are located 2 miles out beyond the natural Lake Michigan shore line on a peninsula built up over the years of slag discharged from Inland's blast furnaces and open hearths. Steel was first poured by the company in 1902 when capacity was 60,000 ingot-tons annually. The four new open hearths add 750,000 tons to annual capacity, lifting Inland's annual capacity to 4.5-million tons.

SAE Men See New Era Ahead

The automotive-aeronautical engineers predict a new future in materials, power sources, fuels. They call for greater freedom in atomic energy developments

THE TOPICS ranged from the kind of power plant Buck Rogers' space ship will have to how heavily the foot should be applied to the car's accelerator pedal for good gas economy. Occasion was the Society of Automotive Engineers' annual meeting last week at the Sheraton-Cadillac, Detroit.

The automotive-aeronautical engineers act and talk as though they are on the threshold of a mighty new era in materials, power sources, and the reasons for now little-understood phenomena. For example, while one group was talking about titanium, discussing its current application and up-coming alloys, another was analyzing results of a new aviation fuel additive and studying what occurs at the spark as the octane requirements of an engine are reduced.

New—The complete newness of many of the subjects which may have bearing on the metalworking industries in future years is indicated by this partial listing: Wear and corrosion resistant coatings for metals, glass-reinforced plastics, nodular iron, atomic energy's industrial applications, helicopter gas turbine design, thermal propulsion for inter-planetary space travel, air weapons development and titanium. The engineers carried their forward thinking even to the mechanics of the meeting itself by televising the operations of a new indoor axle proving ground over closed circuits to their meeting.

The most intriguing of those subjects because it ultimately will have the greatest influence on our lives is atomic energy. To Walker L. Cisler, president, Detroit Edison Co., the development of industrial applications for the splitting atom holds as much or more promise to revolutionize life as the development of the automotive industry had.

"The really great possibilities of atomic energy development appear to lie in the industrial use of the vast new source of heat energy which has been made available," he says, but as of now government law prevents private industry from owning fissionable material or facilities for using such material. "Private industry has not had the opportunity to participate in the development on a competitive enterprise basis as it has in other great developments of the past . . . Without the full participation of industry, the atomic energy development cannot move forward rapidly and on a broad front. There is a great need therefore for Congress to reconsider and modify the terms of present legislation," he says.

ROBERT CASS
. . . elected president of SAE

Plastics — Another far-reaching subject which automotive engineers have only recently decided can be extremely useful to them is glass-reinforced plastics. Speakers on aspects of this topic mold a future for it of almost unlimited size. I. M. Scott, president, Winner Mfg. Co. Inc., believes that historians will one day attach the "plastic age" title to the era being entered.

The Society of the Plastics Industry Inc. figures that reinforced plastics production increased 40 per cent last year, the polyester resin sales rising to 19 million pounds from 7 million pounds in 1949, 9 million in 1950, and 14 million pounds in 1951. Prospect for this year, the plastics society feels, is for another 40 per cent increase to about 27 million pounds of polyester resin.

Mutual Admiration — The plastics men like the looks of the automotive industry, and the admiration is beginning to be mutual. How soon plastics will get a real foothold, they are hesitant to say. The problem presently is lack of a fabricating industry. Present processes for molding car bodies of reinforced plastics tie up a mold cavity four to seven minutes. That delay necessitates for high production more floor space than the auto industry is willing to allow.

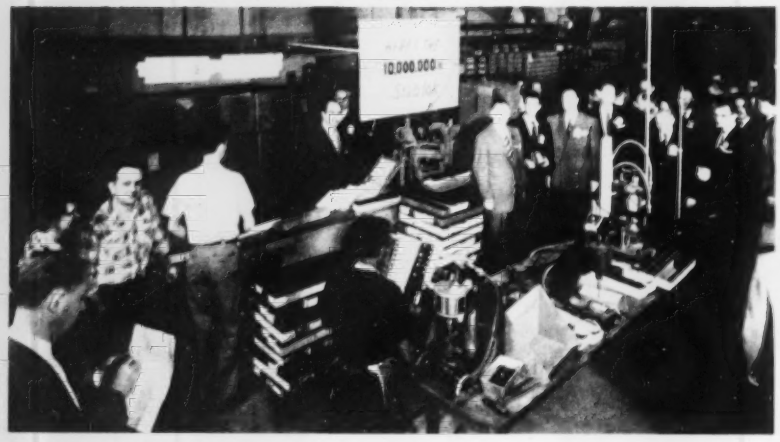
Mr. Scott believes that production of plastic automobile bodies in quantity cannot be undertaken soon, but adds "If a company came to us now with a 5000 to 10,000 bodies-a-year requirement we could talk to them seriously and the tooling cost would be staggeringly low. I think we could do some very nice tooling for $100,000 for 5000 units a year." Use of plastics, furthermore, would open up many new styling opportunities.

New President—Elected to the presidency of the SAE for 1953 was Robert Cass, assistant to the president, White Motor Co., Cleveland.

Cease-and-Desist in Lead Case

Any common course of action to fix prices or restrain competition in the sale or distribution of lead pigments must be discontinued under a cease-and-desist order issued by Federal Trade Commission against the National Lead Co., Anaconda Copper Mining Co. and International Smelting & Refining Co. all of New York; the Eagle-Picher Co. and Eagle-Picher Sales Co., Cincinnati, Sherwin Williams Co. and Glidden Co., both of Cleveland.

Lowell B. Mason filed a dissent in which he challenges the power of the commission to act to prevent price parallelism and further acquisition of property of firms competing in the production and sale of commodities.



10 millionth Stab-Lok comes off the line as . . .

Circuit Breakers Get Simpler

Simplification and standardization have helped promote the use of light-duty circuit breakers. Today, 40 per cent of all new home installations have them

A FEW years ago several big utilities paid subsidies to electric contractors to install circuit breakers in new homes. Today makers of light-duty circuit breakers stand on their own feet competitively, claiming 10 per cent of all new home installations. They hope to make further inroads on a market once conceded to fuse box makers.

Though circuit breakers have long been used to protect heavy industrial and utility loads, the light-duty thermal-magnetic units for lighting, appliance circuit control and light industrial applications have fought many a battle for recognition. Growth of this segment of the circuit breaker industry into what today amounts to an estimated $18-million business follows a pattern long-successful in bringing new products to the public eye and pocketbook: Simplify and standardize design and mass-produce.

The Ford Touch—The formula that worked so well for Henry Ford is doing the same for circuit breaker producers. Last week in Newark, N. J., one of them took the wraps off its production secrets and told how it succeeded in narrowing the differential between fusible circuits and circuit breakers to about 6 cents for the average installation in the modern home.

Federal Electric Products Corp. stamped the UL seal on its 10-millionth circuit breaker Jan. 12, promptly presented it to the man most responsible for its amazing 2½-year production record, Thomas M. Cole, its 31-year-old president. His company (trade marking its product Stab-Lok) has cut circuit breaker prices in half over a 2½-year span. It's got eight plants producing today and is building its biggest at Scranton, Pa.

Simplify, Mechanize — Federal's technique is to design the breaker from its inception with mass-production as a prime objective. Parts were eliminated or combined so that only five elements come together in final assembly: The metal heart, handle, load terminal and contact, kick-off spring, case.

Breakers will interrupt 7000 amperes and operate at least 10,000 times. Average breaker operates four times a year. At its current production rate of 6,000 units a year, Federal says it has a long way to go before its market is saturated. Use of breakers is now allowed in all U. S. electrical codes. Greatest percentage use started in Texas and California, is moving east.

DPA Grants 53 Certificates

San Manuel Copper Corp., near Mammoth, Ariz., leads the list of 53 applicants granted certificates of necessity for accelerated tax amortization from Dec. 18 through Dec. 30, 1952, with $71,228,500 in three authorizations. From 10 to 75 per cent of that is allowed for fast write-off.

The company plans copper and molybdenum mining facilities including a $9-million power plant, $7.5-million railroad and $54-million worth of mining equipment, surface mill facilities, smelting facilities and equipment and power plant equipment. Last July, Reconstruction Finance Corp. granted San Manuel a $91-million loan to undertake the Mammoth project.

Defense Production Administration now has authorized certificates of necessity for $24,082,656,000 for 15,015 new or expanded facilities. Only 61 per cent is allowed for fast tax amortization.

Heat Exchanger Goal Reduced

Defense Production Administration reduced the expansion goal for the production capacity of tubular heat exchanger industry from 58.5-million square feet to 53.5-million square feet of heat exchanger surface by Jan. 1, 1954. The revision came after a re-evaluation of supply and requirements.

Certificates of necessity for fast tax write-off are issued for about 7.2-million square feet of the new capacity, and the industry is providing about 5.8-million square feet without benefit of fast write-off. Direct defense-supporting and military programs are taking more than 90 per cent of the current production of tubular heat exchangers.

Shipyards Fall Short of Goal

American shipyards constructed 724 inland water vessels during 1952, Defense Transport Administration discloses. The actual production was short of the goal of 1000 vessels because of shortages of materials, says John P. Coakley, DTA inland water transport division director.

A breakdown of the figures reveals that of the vessels built 84

were tugs, 42 towboats, 432 dry cargo barges, 145 tanks and 21 miscellaneous nonself-propelled vessels. In addition, 303 more vessels were under construction in 1952 and contracts were issued for 778 others to be started in 1953.

Mr. Coakley says that DTA is "still hopeful that for the four-year period beginning Jan. 1, 1950, and extending through Dec. 31, 1953, we shall see the full DTA expansion goal of 3923 vessels realized."

Larger Chrome Imports Needed

Most users of metallurgical chrome are operating with less-than-normal inventories. If imports of this metal, for which this country is almost entirely dependent on foreign sources, can be sufficiently increased, consumers would use from 20 to 30 per cent more during 1953 than they did last year. United States consumption in 1952 is estimated at 610,000 tons. Controls on use of chrome probably will not be necessary.

The principal deterrent to greater imports is inadequate rail transportation from mine to port in Southern Rhodesia, one of our major sources. Some improvement has been noted in recent months and further improvements are anticipated as materials and rolling stock, purchased in part with the aid of funds made available by the old Economic Cooperation Administration in 1951, become available. The ECA agreement provided for an advance of up to 5-million-pounds sterling to aid in rehabilitation of the line.

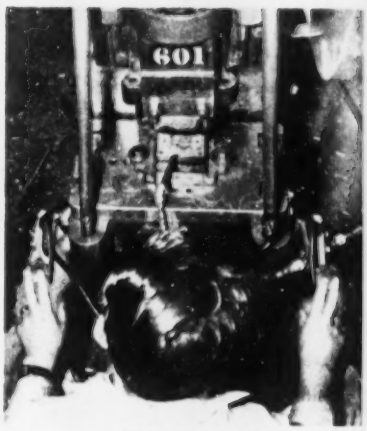
Tokens for the British

The British Token Import Plan will be active again in 1953 says the Office of International Trade. Operated on the same basis as in 1952, the token shipment plan allows U. S. manufacturers to send small shipments of their products to the U. K. even though such imports are generally prohibited.

Included in the list of 197 items eligible for token shipments are certain iron and steel products, electrical apparatus, agricultural and garden machinery, photographic goods and office supplies.

AIR VALVES

Growth of pneumatic control systems has quintupled the number of air valve makers in the last 12 years. Their dollar sales amounted to about $150 million in 1952



Compressed Air & Gas Institute

"IF IT'S an automatic device, it can be air powered," says one Detroit air valve maker.

That's not absolutely true, but nearly enough to allow air valve manufacturers to push sales to a record-breaking $150 million in 1952. Pneumatic applications in the motor city, for example, include actuation of the "iron hand" which pulls steel sheets out of presses, the transfer bars which move cylinder blocks along between machining operations, the torque wrenches which tighten the nuts in assembly operations and the automatic clamping devices which hold work in process. Every pneumatic application in industry requires at least one, usually more, air valves.

Surprise!—Rapid growth of the air valve industry has been a surprise even to new manufacturers who ventured into the field. Many firms report sales have constantly increased each year since they began making air valves five, six or ten years ago.

While most air valve makers expect business to level out in 1953 or perhaps fall off a bit, the long range outlook is optimistic. Two factors buoy it up. One is increasing labor costs which force manufacturers to seek ways to increase productivity. Automation by air is often turned to and that's where air valve makers breeze in. The other is the jet engine which, by making supplies of hot air under pressure available, has promoted the growth of air heating and defrosting systems for aircraft. Previously gas heaters and fans were necessary. Now, the bleed air from jet engines is used.

Good Delivery—The phrase "air valve" can be used to describe everything from a simple half-inch snap valve or tire tube valve to a large butterfly valve used on iron and steel making furnaces. The delivery story differs greatly on these various standard and special valves. In general, delivery dates for standard valves are half of what they were a year ago. And they're running about 10 days to 2 weeks, if the item is not in stock. Delivery on "specials" ranges from 6 to 8 weeks.

These delivery times reflect a substantial easing in materials. Brass for making bronze castings is the major material used in smaller valves as alloy iron and steel are for larger ones. Copper, critical material for solenoid-actuated valves, has eased substantially from a year ago when it was the main shortage on electric valves.

It's in the standard air valves for pneumatic control systems on production machinery where 1953's leveling out in sales will cause the greatest competition. Pressure on sales in this quarter is expected to hold total business for 1953 under $140 million. But, no air valve makers expect to be forced out of business this year and there are five times as many full-line air valve makers today as there were in 1940.

Big Boost for Machine Tools?

ODM advisory group urges continuing governmental purchase of production tools. "More economical than rusting stockpiles," Vance committee says

A NEW CONCEPT of national planning that of retaining a permanently strong military production base is suggested by the final report of the Production Advisory Committee of the Office of Defense Mobilization. Confirming a previous interim report (STEEL, Dec. 1, p. 49), the committee said maximum security can be attained economically by maintaining defense production plants in readiness instead of stockpiling the finished product.

Foremost problem faced by the group under the chairmanship of Harold Vance, Studebaker Corp. president, was to fill the gap between present production capacity and the potential necessary for full mobilization. The committee urged that the government buy $300 million of new machine tools annually for about ten years to keep its inventory of 550,000 tools in good condition. Added production tools would make stockpiling unnecessary. Gaps in the nation's defense could be plugged by Defense department purchase of $1 billion to $2 billion of additional tool and production facilities.

Recommendations—While pointing out that post-Korean mobilization gave first priority to meeting current military needs over increasing capacity, the Vance committee advises ODM to step up efforts to complete a statement of mobilization end-item requirements, to create needed facilities and to stimulate private industry toward the same goal. The lack of a list of requirements is a present difficulty, the group said.

Substitution of production capabilities for end-item reserves is not sufficient of itself, the report continues. Reserve production capacity must be kept up to date and

HAROLD S. VANCE
. . . his ODM group reports

in working order. Towards that end, continued purchases of production equipment were recommended. In determining the proper balance between stockpiles and industrial capacity, the Vance committee suggested that economy should be the standard. Obsolescence is much greater in military items than in production equipment. Reliance upon obsolete weapons could easily spell defeat in an all out war, aside from the monetary loss in stockpiles of rusting equipment.

Aids to Defense — To help the nation build its military production base, suggestions include special consideration to be given production equipment industries in applying wage and price controls. Committee members also asked the Defense department to promote industrial research as a means of insuring that the most modern processes would be available for military production.

Development of new design production equipment, they say, is as vital to our military preparedness as the development of the new weapons themselves.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Milling Machines	Cincinnati Milling Machine Co., Cincinnati
Mortar Shell Parts	Schaible Co., Cincinnati
Mines	American Bantam Car Co., Butler, Pa.
Fuzes	A P Controls Corp., Milwaukee
Small Arms Parts	Loner-Wood Tool & Engineering Co., Detroit
Aircraft Engine Parts	United Aircraft Corp., E. Hartford, Conn.
Carburetors	Bendix Aviation Corp., Detroit
Indicators	Lewis Engineering Co., Naugatuck, Conn.
Pumps	Vickers Inc., Detroit
Amplifiers	Mark Simpson Mfg. Co. Inc., Long Island City, N. Y.
Electron Tubes	Kuthe Laboratories Inc., Newark, N. J.
Teletypewriters	Kleinschmidt Laboratories, Deerfield, Ill.
Automotive Parts	Caterpillar Tractor Co., Peoria, Ill.

Rejuvenated Scrap

Steel scrap collection has grown into $1 billion business, dealers hear in New York convention

MECHANIZATION is rejuvenating the scrap iron and steel industry, a business grown to a $1-billion giant. The scrap man's rise to importance was strikingly brought out last week in an equipment exhibit held during the silver anniversary convention of the Institute of Scrap Iron & Steel in New York.

Some 36 exhibits presented cranes and hoists, magnets, balers, shears, presses, handling equipment and small tools. Displays included working models and photographs to acquaint scrap men with latest advancements in equipment for scrap processing and preparing activities. Increasingly cost-conscious, industry members are accelerating use of similar products. Equipment builders are aggressively cultivating relatively virgin sales territory.

Group Participation—The three-day convention program was arranged to facilitate individual member participation. Questions of fair trade practices, quality scrap and other industry problems were discussed from the floor.

Generally, scrap dealers anticipate high-level business through 1953. Ralph E. Ablon, president of the institute, says indications point to little, if any, drop in operations this year. Other executives say the new year could well become another record-breaker for the scrap industry. Last year more than 30-million tons were shipped by scrap men to iron and steel mills and foundries. Now, with steel ingot capacity expected to top 120 million tons annually over the next several months, record shipments of more than 36-million tons of

purchased scrap would not be surprising. The prediction assumes steel production and foundry operations will remain at capacity levels through the year.

Institute officers serving in 1952 were re-elected for 1953 with Ralph E. Ablon, Luria Bros. & Co., New York, continuing as president, and Edwin C. Barringer, Washington, as executive vice president.

New members of the directorate are: D. Sloan Hurwitz, Buffalo; Nathan S. Addlestone, Sumter, S. C.; Sidney Grossman, St. Louis; Milton Mahler, Detroit; Max Schlossberg, Chicago; Samuel Shapiro, Phoenix, Ariz.

CHECKLIST ON CONTROLS

Materials Orders

ELECTRIC UTILITIES—Revocation of Direction 2 to NPA Order M-50, effective Jan. 7, 1953, restores to the electric utilities industry the normal 90-day level of steel inventories. The direction imposed a 60-day limit on the industry after the steel stoppage.

ELECTRIC UTILITIES — Amendment 1 of NPA Order M-50, issued and made effective Jan. 14, 1953, provides full first and second quarter, 1953, and advance quarterly allotments of controlled materials for "minor requirements" of electric utilities.

Price Regulations

INGOT MOLDS, STOOLS — Amendment 5 of Supplementary Regulation 3 of CPR 30, issued and effective Jan. 5, 1953, states that ingot molds and stools definitely are not covered by this regulation. CPR 60 covers them.

BAUXITE—Amendment 30 of General Overriding Regulation 30, issued and effective Jan. 9, 1953, exempts from ceiling price regulation sales of bauxite between affiliated corporations.

REBUILT, USED AUTO PARTS — Amendment 1 of CPR 139, issued Jan. 9, 1953, and effective Jan. 14, permits rebuilders of automotive parts who find it impractical to determine ceilings by percentage adjustments applied to the original manufacturers' ceiling prices to apply to OPS for ceilings determined in their customary manner.

INDUSTRIAL SCALES—General Overriding Regulation 42, issued and effective Jan. 12, 1953, authorizes an increase of 6 per cent in ceiling prices for manufacturers of industrial scales and balances.

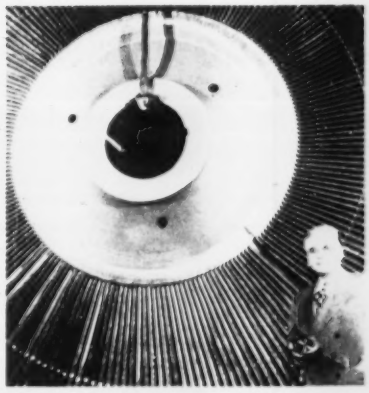
MACHINERY—Amendment 44 of CPR 30, issued and effective Jan. 12, 1953, permits manufacturers of machinery and related manufactured goods to apply for approval of changes in their list prices and discounts when such changes do not increase the general level of ceiling prices.

COAL TAR—Amendment 14 of Supplementary Regulation 13 of General Ceiling Price Regulation, issued Jan. 12, 1953, and effective Jan. 14, authorizes processors of coal tar to increase ceiling prices by about 6 per cent.

BEEHIVE OVEN COKE—Amendment 15 of Supplementary Regulation 13 of General Ceiling Price Regulation authorizes an increase in prices of beehive oven coke averaging 6 per cent. It was issued and made effective Jan. 12, 1953.

CASTINGS—Amendment 9 of CPR 60, issued and effective Jan. 13, 1953, states specifically that all cast rolling mill rolls are covered by this regulation.

PLUMBING FIXTURES—Amendment 1 of Supplementary Regulation 26 of CPR 22, issued Jan. 12, 1953, and effective Jan. 17, authorizes an increase of approximately 1.85 per cent in current ceiling prices for manufacturers of enameled cast iron plumbing fixtures. Because the increase reflects increased costs of metals, Amendment 6 of General Overriding Regulation 35 places such fixtures in Appendix C, the list of materials not permitted further materials costs adjustments. It was issued and made effective simultaneously with Amendment 1 of SR 26 of CPR 22.



Shows Contrast in Sizes

Largest and smallest turbine wheels manufactured in 1952 by General Electric Co., Schenectady, N. Y., appear above. Forming a background for Glenn Warren, general manager of the company's turbine division, is a 14-foot wheel which revolves 1800 times per minute in a steam turbine. Mr. Warren holds the smallest wheel, no more than six inches in diameter

Steel Production in 1952: Third Largest in History

STEEL PRODUCTION in 1952 was the third largest in history. Furnaces poured 93,149,213 net tons of steel for ingots and castings, compared with 93,166,518 net tons in 1951. The steel strike cost the nation an estimated 18-million tons in 1952.

Record production in the fourth quarter totaled 28,928,716 net tons, or more than 2.1-million tons over steel output in the final three months of 1951. Steel mills in December produced 9,683,000 net tons, compared with 9,438,886 net tons in November and 8,890,678 net tons in December, 1951. The accompanying table shows details.

The American Iron & Steel Institute says that industry capacity reached 117,547,470 net tons on Jan. 1, 1953. Steel capacity is rising toward an expected figure in excess of 123-million tons annually.

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly	No. of weeks
1952	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	production (Net tons)	in mos.
January	8,103,123	100.7	407,298	89.3	625,696	89.7	9,136,117	99.3	2,062,329	4.43
February	7,703,066	102.4	382,712	89.8	571,432	87.6	8,657,210	100.7	2,091,114	4.14
March	8,401,140	104.4	378,861	83.1	624,190	89.5	9,404,191	102.2	2,122,842	4.43
1st Qtr.	24,207,329	102.5	1,168,871	87.4	1,821,318	89.0	27,197,518	100.7	2,092,117	13.00
April	7,101,199	91.1	323,006	73.2	566,937	83.9	7,991,142	89.7	1,862,737	4.29
May	7,291,865	90.6	318,642	69.9	594,089	85.2	8,204,596	89.2	1,852,053	4.43
June	1,446,927	18.6	22,862	5.2	169,702	25.1	1,639,491	18.4	382,166	4.29
2nd Qtr.	15,839,991	67.0	664,510	49.6	1,330,728	65.0	17,835,229	66.0	1,370,886	13.01
1st 6 Mos.	40,047,320	84.8	1,833,381	68.5	3,152,046	77.0	45,032,747	83.4	1,731,363	26.01
July	1,347,587	16.8	2,000	.04	277,371	39.8	1,626,958	17.7	368,090	4.42
August	7,599,888	94.4	309,361	67.8	589,438	84.5	8,498,687	92.4	1,918,440	4.43
September	8,039,128	103.4	351,620	79.8	671,357	99.6	9,062,105	101.9	2,117,314	4.28
3rd Qtr.	16,986,603	71.2	662,981	49.1	1,538,166	74.4	19,187,750	70.4	1,461,367	13.13
9 Mos.	57,033,923	80.2	2,496,362	62.0	4,690,212	76.1	64,220,497	79.0	1,640,789	39.14
October	8,747,640	108.7	347,042	76.1	712,148	102.1	9,806,830	106.6	2,213,731	4.43
November	8,396,227	107.7	336,902	76.3	705,757	104.5	9,438,886	105.9	2,200,207	4.29
†December	8,664,000	107.9	343,000	75.4	676,000	97.1	9,683,000	105.5	2,191,000	4.42
†4th Qtr.	25,807,867	108.1	1,026,944	75.9	2,093,905	101.2	28,928,716	106.0	2,201,577	13.14
†2nd 6 Mos.	42,744,470	89.7	1,689,925	62.5	3,632,071	87.8	48,116,466	88.2	1,831,613	26.27
†Total 1951	82,841,790	87.2	3,523,306	65.5	6,784,117	82.4	93,149,213	85.8	1,781,737	52.28
December	7,885,830	102.2	396,831	83.3	608,017	94.9	8,890,678	100.6	2,011,466	4.42
4th Qtr.	23,665,396	103.1	1,266,913	89.4	1,879,607	98.7	26,811,916	102.1	2,040,481	13.14
2nd 6 Mos.	46,720,240	101.8	2,520,060	89.0	3,655,563	96.0	52,895,863	100.7	2,013,546	26.27
Total	93,166,518	102.3	4,890,946	87.0	7,142,384	94.5	105,199,848	100.9	2,017,642	52.14

Note—The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons. The percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons open-hearth, 107,806 net tons bessemer, 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of Jan. 1, 1951, as follows: Open-hearth 91,054,020 net tons, bessemer 5,621,000 net tons, electric 7,554,630 net tons; total 104,229,650 net tons.

† Preliminary figures, subject to revision.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

The government's use of contractors' technical information will be more limited as an ambiguous subparagraph in procurement regulations gets changed

GOVERNMENT contractors have been partially successful in their fight to get two important changes in the Armed Services Procurement Regulation. After many years of struggling, the so-called "little d" provision, covering use of contractors' technical information by the government, will be replaced by more explicit language.

Contractors lost out on their request that supply contracts be placed with the research and development contractor who developed the item. The armed services continue to maintain the purpose of a research and development contract is to make the government free to negotiate contracts with any manufacturer or manufacturers in subsequent procurement.

What It Is—"Little d" (Subparagraph d, Section 9-107.1 of the ASPR) is ambiguous. Under it both the government and the contractor can make interpretations in their own favor. Too, there has been a lot of objection to including the technical rights provision in the patent provisions.

So "Little d" is to be deleted from Section 9-107.1 and treated separately in Part 2 of Section IX. Three clauses have been set up there to cover three different classes of rights. They are intended to meet fully the two principal objections: Use of the contractor's drawings by foreign industry under the NATO agreement, and use of the contractor's drawings to solicit bids from other companies and thus encourage new competition.

Three Spheres—The first of the three new clauses covers "Limited Right To Use Information" that is, the usual rights to use technical information for instructional, operational or maintenance purposes. The second covers "Unlimited Use of Information" by the government. The third provides for a mixed arrangement under which the rights to the contractor's technical information by the government are to be determined in negotiation.

The new clauses will not become effective until representative contractors' organizations have had a chance to study them and make comments and suggestions. Such comments are to be addressed to the Office of Procurement, Munitions Board, which will process them through the Armed Services Procurement Regulation Committee.

Copies of the new clauses, with the request that comments be furnished by Feb. 1, have been sent to: Aircraft Industries Association of America Inc.; Automobile Manufacturers Association; American Ordnance Association; Machinery & Allied Products Institute; National Association of Manufacturers; National Security Industrial Association; Chamber of Commerce of the United States; Shipbuilders Council of America; Radio and Television Manufacturers Association; American Patent Law Association, Philco Corp., and Joint Electronics Industry Committee.

Army Founds Foundry Unit . . .

The United States Army has just activated its second foundry unit, the 551st Foundry Detachment, Army Engineers, to be stationed in Germany to produce repair and replacement castings for tanks, tractors, power shovels and other equipment used by our armed forces there. It will operate an electric induction furnace with capacity of 210 pounds per melt. Rated capacity, on a 24-hour basis, is 2000 pounds of gray iron, or 1600 pounds of steel, or 1800 pounds of bronze castings. Like the parent 579th Foundry Detachment, Army Engineers, Fort Belvoir, Va., it consists of 16 men.

The Army went into the foundry business May 1, 1949, when the Fort Belvoir detachment was activated. It has two basic functions:

PESKY SUBPARAGRAPH GOES . . .
"Little d" cut form U.S. buying rules

Producing replacement castings needed by the Army Engineers, and training personnel in foundry skills.

One-Man Load . . .

First all-titanium end product to be placed in production by the armed forces is the base plate for the 81-millimeter mortar. It has been ordered by Army Ordnance Corps from the Watervliet Arsenal in "limited" numbers. The principal advantage gained is that, made of titanium, the base plate weighs 25 pounds so that it can be carried easily by one man. The same base plate in steel weighs 48 pounds and is made in two pieces carried by two men.

The titanium base plate withstands a greater pressure, permitting use of a new round of ammunition which has a greater range. It's made of sheet, welded by a technique developed by the Bureau of Mines at College Park, Md.

Question of Cost . . .

Can alumina be produced at reasonable cost from the abundant anorthosite (aluminum silicate) rock of Wyoming and thus broaden the domestic raw material base of our aluminum industry? To get the answer to that question, the Bureau of Mines is about to launch a comprehensive research program at Laramie, Wyo.

The Facts about
Electric Motors for Fork Trucks
...and what they mean to you

MANY users of electric industrial trucks feel all they need to know about the motor is that it has adequate power and the label of a well-known manufacturer.

Actually, there's much more to it than that.

These Facts May Surprise You

Motor requirements for industrial trucks are radically different from those of any other DC motor.

Even good *vehicle* motors fall way short of being a good motor for industrial truck applications.

A Truck Motor Has to Be Different

The "pigs is pigs" philosophy just doesn't make sense when you're talking about industrial truck motors. If you are a careful buyer, you are naturally interested in the best possible performance: the performance of your truck can be no better than the motors which supply power for travel, lift and tilt.

Why can't ordinary commercial motors give you the power and dependability you want? Well, look at industrial truck power requirements:

The travel motor must accelerate the loaded truck 300 to 700 times a day. The hoist motor must lift and tilt the load for every loaded start.

An industrial truck motor should be designed to meet the requirements of the toughest conditions under which it will operate. For example, take a 4000 pound capacity fork truck. You need only 3½ horsepower normally. Yet under certain conditions the motor might have to put out, momentarily, as high as 50 horsepower.

But it just isn't practical to use a motor capable of delivering maximum requirements continuously. Such a motor would be much too large, too heavy, too expensive.

Why Baker Builds its Own Motors

No motor made for ordinary industrial use stands up as well as our own to the rugged requirements we've outlined. That's why nearly every industrial truck we produce contains our own Baker motor.

Baker truck motors are the result of almost 50 years' motor design experience.

During this half-century, Baker has learned a lot about motors. We've developed, and patented, many exclusive features to make our motors the best industrial truck motors available.

Let's look at some of these "exclusives", and see what they mean to you.

Almost 25% more Power. The unique design of the armature in a Baker motor provides a cross-section of iron in the armature windings of almost 25% more area than is found in other motors of comparable size.

The more cross-section you can get into an armature, the more magnetic force you can introduce into it. This is true for the same reason that it's easier to force a given amount of water through a large pipe than a small one, in the same time.

Easier Maintenance. When the leads on most motors burn out and need repairing, it usually means a 5 to 15 hour job. The same work on a Baker motor takes less than one hour and is required less often.

Here's why: Most motors are built with leads from the fields running through insulated holes in the motor housing. These leads are jarred and rubbed constantly by the truck's vibration. When the fine strands break, the leads burn out. Repairing these leads takes as long as 15 hours on the ordinary motor, because to get at them you must dismantle the motor.

But Baker uses external terminals, mounted on the motor casing. Leads from the field are soldered in slots at the base of the terminal.

Since there is no flexing at this terminal, lead failure is rare. When it happens, repair takes only a few minutes—not hours.

Fewer Burn-outs. Each Baker field coil is made of two parallel sets of coils, wound so both ends of wire for each set are on the outside.

Coils can be connected in series or parallel, depending on what you need. The parallel connection gives you more speed; series connections provide more torque. And you can make the change from one to the other in half an hour.

Another advantage of our field coil design: Because there are no soldered connections inside the coil, which is the coil's hottest point, risk of failure here through melted connections is eliminated.

More Power—Less Heat. A good industrial truck motor takes heavy over-loads without heating up excessively. Yet it's small enough to fit the compact design of the modern truck. Baker engineers designed the Baker motor to meet these requirements by including *30% more copper* in our motor than is found in any other motor of comparable size.

This bonus copper is built into the motor without increasing the motor size by using rectangular copper wire instead of the conventional copper rounds in its armature and field coils. This gives us a fuller use of the cubic space in these windings. It gives *you* more emergency power with less danger of burnouts.

These and the many other exclusive features in the Baker motor make it able to deliver more power per unit of current than any other motor of its size and weight.

These are further examples of the user-benefits researched and engineered by Baker, the oldest name in electric vehicles.

For your copy of a new 8-page booklet on Baker equipment write for Catalog 54.

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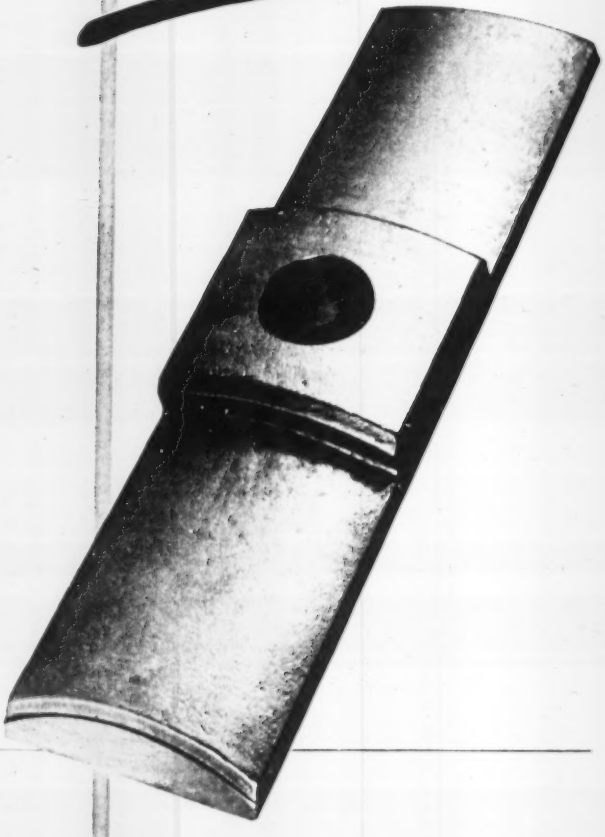

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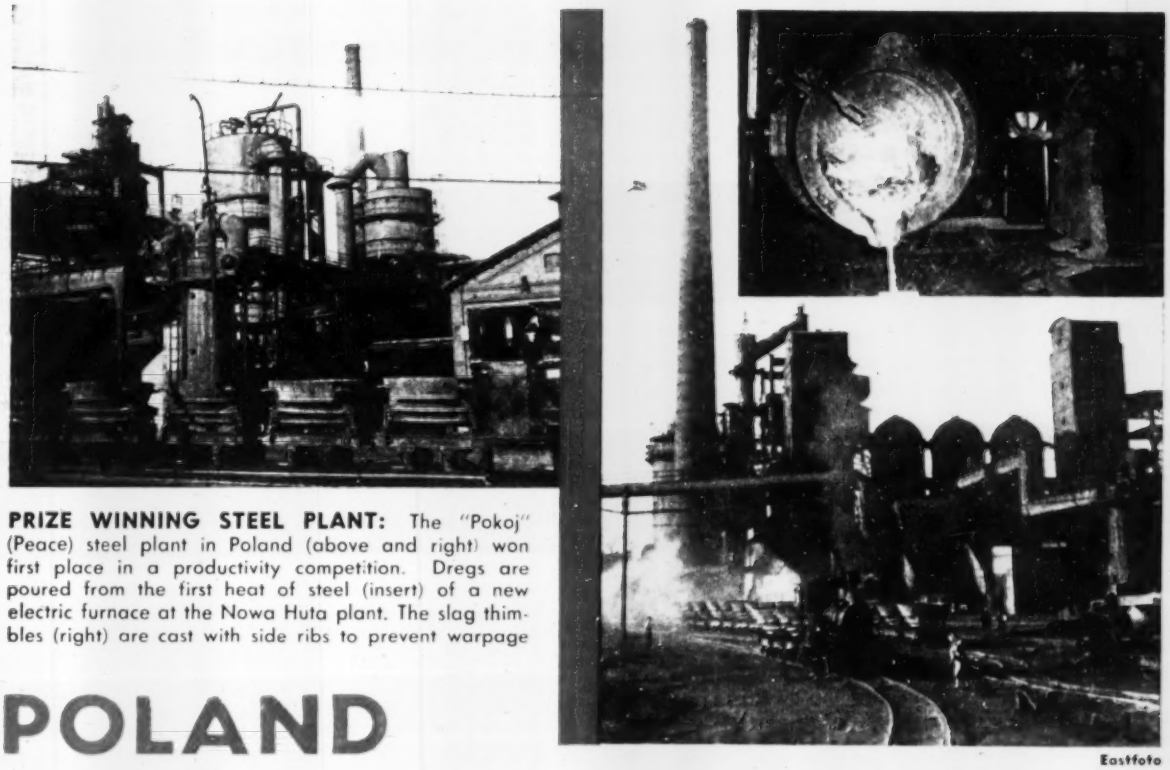

PRIZE WINNING STEEL PLANT: The "Pokoj" (Peace) steel plant in Poland (above and right) won first place in a productivity competition. Dregs are poured from the first heat of steel (insert) of a new electric furnace at the Nowa Huta plant. The slag thimbles (right) are cast with side ribs to prevent warpage

Eastfoto

POLAND
Pushes Industrial Expansion

Some of the glitter disappears from foreign accounts, though, when one realizes that among the latest pieces of Polish farm equipment is a horse-drawn potato digger

REPORTS indicate no slackening of industrial expansion behind the iron curtain. But, many progress stories sound impressive mainly because the communists have so far to go. The latest Russian five-year plan (1951-55) calls for these production boosts:

Pig iron output, up 76 per cent in 1955 over 1950; steel production up 62 per cent over 1950 and rolled steel products up 64 per cent. Thus, the steel output in Russia should, according to plan, be 48.6 million tons in 1955. Poland, as one of the Russian satellites, has its own six-year expansion plan, due for completion in 1955. Poland's target is 5,060,000 tons of steel output by that time.

Within Reason—STEEL's Metalworking Yearbook issue (Jan. 5, p. 160) shows Polish steel output rose to 3,575,000 tons in 1952 from 3,071,200 tons in 1951. With continued expansion at that rate, Poland will accomplish its goal.

The Polish embassy released news of other industrial progress in that country. Most notable is the opening of a new blooming mill at the Bobrek Iron & Steel Works in the Katowice district. The mill will roll about 1 million tons of steel annually.

More Furnaces — In Upper Silesia, one of the two largest blast furnaces in the country went into operation at the Kosciuszko Iron & Steel Works. In Nova Kuta, a city near Krakow, a second electric furnace for steel making began operation in December, 1952.

On Dec. 3, a new coal mine at Ziemowit in Upper Silesia went into operation. Its output, plus the production of another mine opened previously and the output of certain "other collieries" will contribute about 2 million more tons of coal annually toward the 1955 production goal of 100 million tons, says the embassy report.

Horse of Another Color—To keep the procress story of Poland in better perspective, however, comes this statement from the Polish embassy report: "The agricultural machinery industry . . . raised its total production 10 per cent above that of 1951. Among its accomplishments during the year was the production of 14 new types of farm machines and implements, including . . . mass production on horse-drawn potato planting machines."

Iron Ore Output Up and Out

Venezuelan iron ore production nearly doubled in the first nine months of 1952 over the first three quarters of 1951. During the same period, iron ore exports nearly tripled. Venezuelan production was 841,341 tons for the first nine months in 1951 and 1,465,550 tons in 1952. Exports of iron ore were 469,668 tons for the first nine months in 1951 and 1,265,617 tons in 1952.

HERE'S THE SITUATION . . .

1. About 24 per cent of metalworking firms have supervisor training programs.
2. Of these, 90 per cent use subjective methods (management interview and/or observation) to determine training needs.
3. But only about 10 per cent use a systematic research technique to determine needs.
4. And only 2.25 per cent have studied the relative merits of various training methods or aids!

Executive Training Programs

Industry's insuring its future. The post-war boom in executive training programs shows that. But inefficiency in training methods is costing unduly high premiums

INDUSTRY'S making sure its future wheels are well-rounded as executive training programs roll ahead at a greater rate than ever before.

Training programs at the foreman level got their big impetus during the last war as industry was besieged by people in brand-new overalls; they proved so profitable they have been continued and strengthened since. But the concern about swivel-chair recruits is a somewhat post-war phenomenon, evangelized by the swelling ranks of industrial psychologists and a logical extension of supervisor training which is farther down the scale.

Still Spreading — Nash-Kelvinator Corp. and Packard Motor Car Co., Detroit, are both in the process of setting up programs. Dravo Corp., Pittsburgh, has just put its program under way. Firms like U. S. Rubber Co., New York, Brush Development Co., Cleveland, and Ford Motor Co., Detroit, have had programs in effect for some years. Others, like U. S. Steel Corp., Pittsburgh, have programs going back before World War I.

All of these firms have this in common: They believe that good executives are made as well as born and therefore investment in executive training is investment in the future of the company. Without exception they're enthusiastic about the programs and feel the development of leadership potential in younger, aggressive men will strengthen their position competitively.

Over-eager—However, management's eagerness to get on the executive training bandwagon has led in some cases to quantity rather than quality programs. Virtually synonymous with executive training in the minds of some training directors is a sort of musical-chairs arrangement in which as many men as possible hold as many jobs as possible for a fixed length of time. When the training director's whistle blows, everyone moves over and views the company from the next seat until the whistle blows again.

Arrangements are made with colleges for formal courses, but in many cases the prospective executive picks his own or is permitted to take anything that "seems sound" with the company paying all or most of the tuition. Net result of such programs is likely to be a jack-of-all-trades individual who feels competent to do anything and actually is equipped intensively to do nothing.

Selection of candidates for the management training program is also weak in some firms. Bright-eyed young men who have attended college or appear to be more intelligent than most to their immediate supervisors are put on the merry-go-'round with no measured appraisal of their abilities and aptitudes. Little wonder the training in some cases "doesn't take."

Unpointed, To Be Blunt—That's

STEPS YOU CAN TAKE . . .

☑ **1. Don't try to train all men for all jobs.**
You'll give some more training than they need, undertrain others. That's the biggest weakness in executive training today, say training researchers.

☑ **2. Analyze job structure.**
Which jobs in your organization require specialized training? The number and kind of such jobs are the key to whether or not you need an executive training program.

☑ **3. Evaluate jobs in terms of:**
Job Factors (derived from straight job analysis)
(a) What is the person holding the job actually required to do?
(b) What kind of training is required to do it?
Personnel Factors (derived from psychological testing of persons now doing the job well)
(a) What intelligence level is required to do the job?
(b) Are any special aptitudes required? (mechanical ability, spatial relations perception, mathematical aptitude, etc)
(c) What personality traits contribute to doing the job best?

☑ **4. Evaluate men.**
(a) Use psychological testing to determine which men in your organization have raw materials—intelligence, personality and aptitude—most closely matching those required by the jobs.
(b) How much training do these men already have? If they have too much to learn, training might prove too costly.

☑ **5. Match the men and jobs.**
Some men may be qualified for many of the jobs. General training may be warranted in such cases, but current feeling is that it's better to pinpoint training as much as possible.

☑ **6. Set up the training program.**
(a) In-plant training. Some aspects of the needed training can best be handled in the plant. Basic information can be handled in classes or through group orientation talks given by various department heads. Some training can only be driven home through systematic job rotation. Appoint a training director to set up and co-ordinate your training program.
(b) Formal training. Outside education will be required for many jobs. Your training director will find colleges and business schools in the area eager to co-operate in determining which courses are needed by each man.
Conclusion: That's the formula for a sound executive training program. You know what the jobs require and what the men have to offer. The difference is training. Tailor your training program to each man and when that young executive is needed he'll be ready to step into the role you've prepared him for.

why questions are being asked today about executive training. Dr. Walter R. Mahler of the Psychological Corp., New York, in a study for the Army to learn how industry trains its executives, found that only about one company in ten who have executive training uses a systematic research technique to determine its training needs; not more than one company in 40 has actually studied the relative merits of various training methods or aids. His conclusion is sobering:

"Industry and business in the main have not made use of research methods to determine training needs or to evaluate the outcome of their training. A few companies have employed research methods to advantage. A definite trend toward more precise evaluation was noted. In general, the Army cannot gain much from industrial practices in this (executive training) area."

Growing Pains—The tools for executive brain sculpture are constantly being improved. Such groups as the American Management Association, New York, spread the latest word in the field, hold seminars and training schools. Their goal is to get training programs off on the right foot and keep them going correctly and effectively.

The Mahler report raises a double-barreled question for industry: If you have a training program now, are you getting the most for your money? If you haven't got a training program, should you have one? The accompanying checklist will help you decide. Chances are good that your firm could profit from an executive training program tailored to your needs and pointed toward the development of the executive talent your company will need in the future.

Extend "Stock Item" Exemption

"Stock item" exemption has been extended six months by the Renegotiation Board to July 1, 1953. The stock item exemption applies to sales under defense subcontracts of items, including maintenance, repair and operating supplies, when they are customarily purchased for stock in the normal course of a defense contractor's business. It does not apply to materials specially purchased for use in the performance of renegotiable business. Examples of stock items include nuts, bolts, screws, spark plugs and other articles normally kept in stock for all use.

Castings Group Organized

Increased technical and commercial liaison in the field of castings may result from work of a newly-formed temporary committee to organize investment castings firms. Some 24 companies were represented at a Cleveland meeting to discuss forming an association of companies in the investment castings industry.

Kenneth Bartlett, manager of metallurgical products division of Thompson Products Inc., Cleveland, is the chairman of the temporary committee. While explaining that several weeks of organizational work lie ahead, he estimates that 30 companies in major national industrial areas would be interested in joining an investment castings association.

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By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Many believe Reuther's implied threat to strike, if contracts with automakers aren't rewritten by Mar. 1, is mere talk. Current company-union relations are cordial

DETROIT

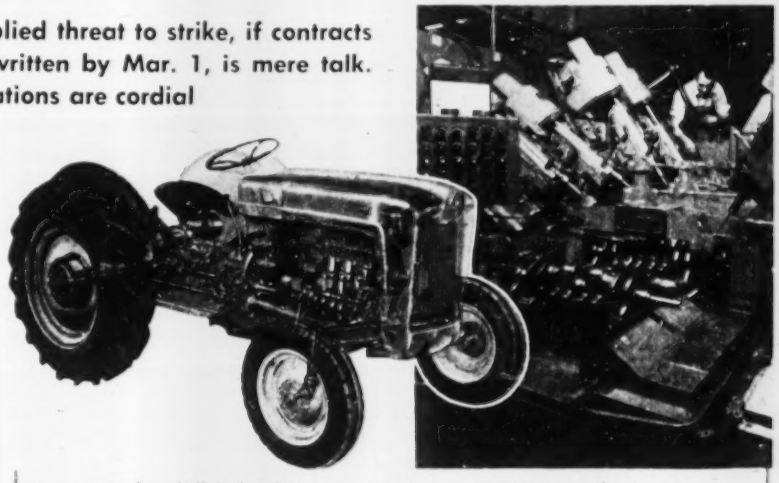
SOME NEWSPAPER headlines read like this: "Reuther issues pay ultimatum." Walter P. Reuther, CIO and UAW president, had stated at a press conference that "abnormal inflation" makes changes in the long-term automobile contracts necessary if they are to remain "living documents."

The changes which the UAW seeks had been proposed to the automobile companies previously and a number of discussions have been held with each of the "big three." For the first time, however, the threat to walk out unless these changes are agreed to was implied.

The Words — "Obviously," said Reuther, "in the absence of an agreement by Mar. 1, there is no contract."

A week has now passed, and while the outcome cannot yet be predicted with any certainty, some observers have explanations of Mr. Reuther's motives and ideas on how the issues will be resolved. The reason, first, for the Mar. 1 deadline is two-fold: Agreement will have to be reached before then as to how conversion to the new BLS Index (see STEEL, Jan. 12, p. 42) which governs the escalator clause will be accomplished, and Reuther will be facing his UAW convention later in March and would like to hand it a bunch of contract changes bearing auto companies' seal of approval. Since the BLS Index matter must be straightened out and contract terms which apply to it changed, the time is right, the union feels, to press for the other changes simultaneously.

Backbone—There are no indications, however, that the companies will feel any compulsion to make the UAW-wanted contract changes while they're talking about the new BLS Index. This is not to say that there may not be a possibility of incorporating some of the UAW's



Avey transfer drill helps bring automation to tractor manufacture as . . .

Ford Marks 50 Years of Making Farm Equipment

When Ford Motor Co., Dearborn Motors Corp. and individual members of both organizations settled the $342-million lawsuit brought by Harry Ferguson and Harry Ferguson Inc. for $9.2-million after the case had dragged along in court for more than four years, there was much quiet speculation as to why the matter was brought to such an abrupt end. The settlement was made to satisfy patent infringement claims by Ferguson, and the claims of conspiracy, unfair competition, etc. were dismissed.

Recently Ford's tractor and farm equipment marketing organization, Dearborn Motors Corp., showed the reason for its action—a new tractor which it did not want involved in any pending patent litigation. The 50th anniversary model comes the closest to having sex appeal of any barnyard mechanism. There's small point in a tractor being trimmed to outshine passenger cars, but there is a sales advantage in having a product with esthetically pleasing functional lines.

Its newness is by no means limited to the sheet steel exterior. From a user's standpoint the important changes include a new four-cylinder overhead valve engine of higher horsepower, new systems of hydraulic control putting power at the driver's command whenever the engine is running and regardless of whether the tractor is stationary or moving and providing for speed variation of the hydraulically actuated appurtenances.

For a considerable segment of the metalworking industries, the product itself is of somewhat less interest than the way it is made. Ford almost completely retooled its Highland Park tractor line for manufacture and assembly of the new model. One of the transfer-type tools used for cylinder block machining was described briefly in this column on Sept. 1, 1952.

Although nowhere near as high a production operation as most automaking plants (its daily rate is about 500 units), the facility nevertheless has been automated to an unprecedented extent for the tractor industry.

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suggestions. Relations with the UAW currently are extremely cordial, and Mr. Reuther's remarks to the press are believed in some circles to be an inevitable part of a labor politician's duties.

The proposed changes include setting a floor under the escalator clause and incorporating part of the cost-of-living allowance in the base rate, increasing pension benefits to offset price inflation since the monthly amount of pensions was determined, upping the annual improvement factor by a cent an hour, abolishing compulsory retirement, and adjusting wage differentials for certain skills.

Give and Take—There is give-and-take in the companies' attitude toward these requests, and they, too, think that the contracts should be living documents. They also intend to maintain the integrity of these contracts by insisting that they remain in effect until 1955 but not necessarily without modifications.

The only danger to labor stability in the automotive industry, as it appears now despite the outwardly threatening signs of the moment, is that one of the parties might get himself cornered and might have to fight to get out so that "face" would not be lost. None of the parties intends to let that happen, and there will be an extremely conciliatory attitude all the way around to prevent it. The companies, it is understood, can see some justification for some of the union's requests. For their part, however, it is not inconceivable that they will want to get a little something from the union if they give a little on some of the points. So far no one has any intention of getting "hard" about anything that will disrupt the high production pace. (For a roundup on the complete metalworking labor situation, see p. 45.)

Red Tape Cost: $5 Million Yearly

Imagine an office with 750 people in it doing nothing but filling out forms for the federal government. That's the staff employed by the automotive industry, according to a survey conducted by the Automobile Manufacturers Association.

In a year's time those people pile up one and a half million man-hours and cost their companies more than $5 million. Furthermore the figures tell only part of the story. Not included in the survey were the time and manpower spent in compiling reports and filling out the blanks for the Office of Price Stabilization and the Wage Stabilization Board. And it didn't count the midnight oil burned by weary men puzzling over the meaning of government regulations or the miles covered between Washington and automobile plant cities.

Appeal—The statistics were put on the government's Budget Director Frederick J. Lawton's desk with this message from AMA's managing director, William J. Cronin:

"The figures given in our survey are very conservative (and) do not reflect the full load of reporting borne by motor vehicle manufacturers. We would like to recommend considerably greater activity in the work of co-ordinating, eliminating duplication, and generally reducing the burden on industry of submitting reports to federal government agencies."

CMP Paperwork — On which agencies' reports is the most time spent? Leading by a handy margin are forms for the Controlled Materials Plan under the National Production Authority. Its reporting forms take 784,251 man-hours a year to fill out. Other NPA forms take 58,000 additional man-hours. Filling out federal tax returns costs automotive companies, not including several of the largest who did not answer AMA's question on this point, 305,000 man-hours annually.

Here are some of the other government agencies and the number of man-hours required to fill in their blanks: Department of Defense, 46,469; Air Materiel Command, 15,608; Bureau of Census, 8693; Bureau of Labor Statistics, 4024; Bureau of Mines, 3164; Renegotiation Board, 4595; Securities Exchange Commission, 3893. The AMA has not tried to find out how much of a boon this work has been to the ink and typewriter ribbon producing industries, but it feels rather strongly that it hasn't helped the automotive industry's labor shortage.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	592,253	505,758
October	645,862	558,971
November	550,885	480,323
December	568,577*	402,729
Total	5,976,189	7,179,161

Week Ended	1952	1951
Dec. 13	121,590	115,627
Dec. 20	134,933	107,186
Dec. 27	102,558	39,488
	1953	1952
Jan. 3	106,102	53,601
Jan. 10	139,446	92,741
Jan. 17	140,000*	98,669

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Hydra-matic for GMC Truck

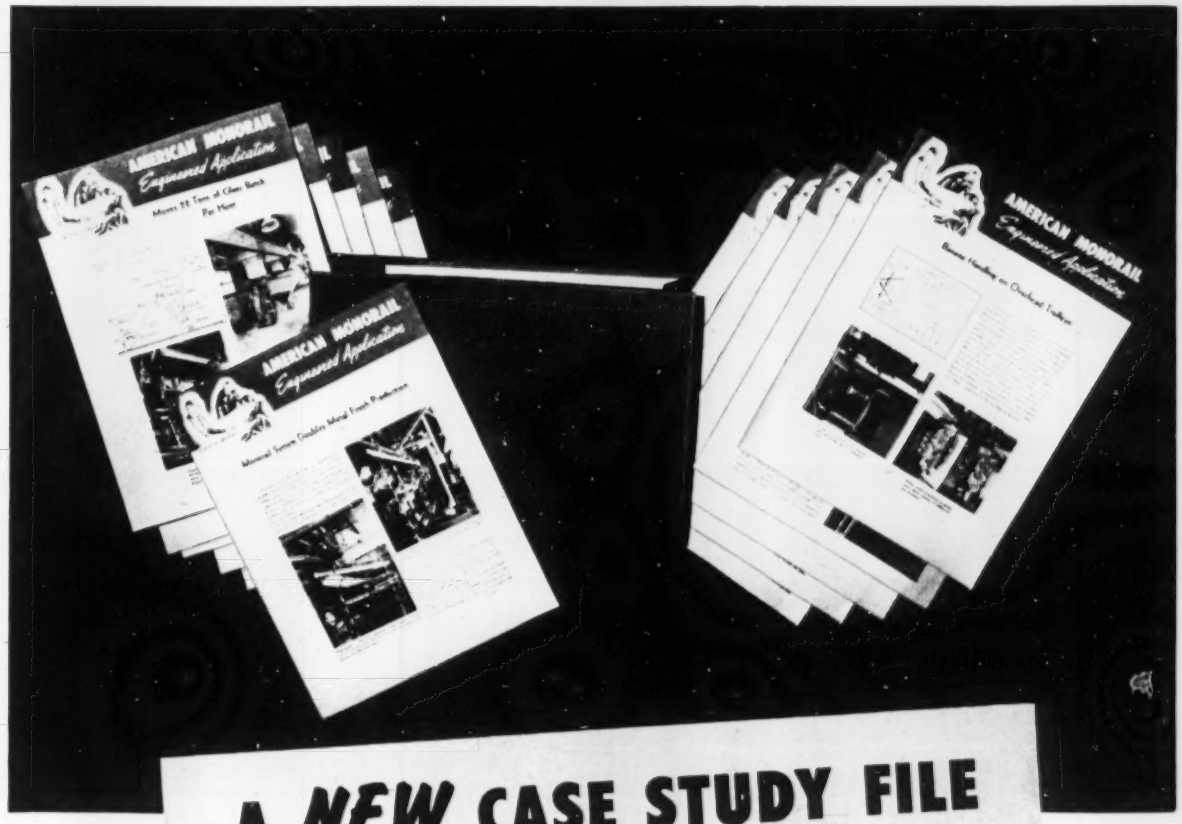
About the last act of GMC Truck & Coach Division's General Manager Roger M. Kyes before assuming his new duties as undersecretary of defense in the Eisenhower administration was to announce the availability of an automatic transmission Hydra-matic throughout GMC's line of light trucks. Two new gasoline engines for truck use, using higher compression ratios than many passenger cars, were also introduced. Dual-range Hydra-matic transmission will be standard equipment on the parcel delivery and will be optional in pick-ups, panels and other light truck types.

Aircraft Continues to Rise

Actual deliveries of aircraft have not reached their peak, the Aircraft Industries Association predicts, despite a slash in the government's aircraft procurement funds from $13.8 billion in 1953 to a proposed $8.3 billion in the 1954 fiscal year budget.

Estimates are that the 15 largest companies in aviation will have total deliveries of $5.5 billion in 1953, up $1.2 billion from 1952.

Producers expect over-all output to drop in 1955, and when this occurs most prime contractors can cut down on subcontracting. At that time they hope to bolster their business by production of guided missiles and increased work with jet aircraft.



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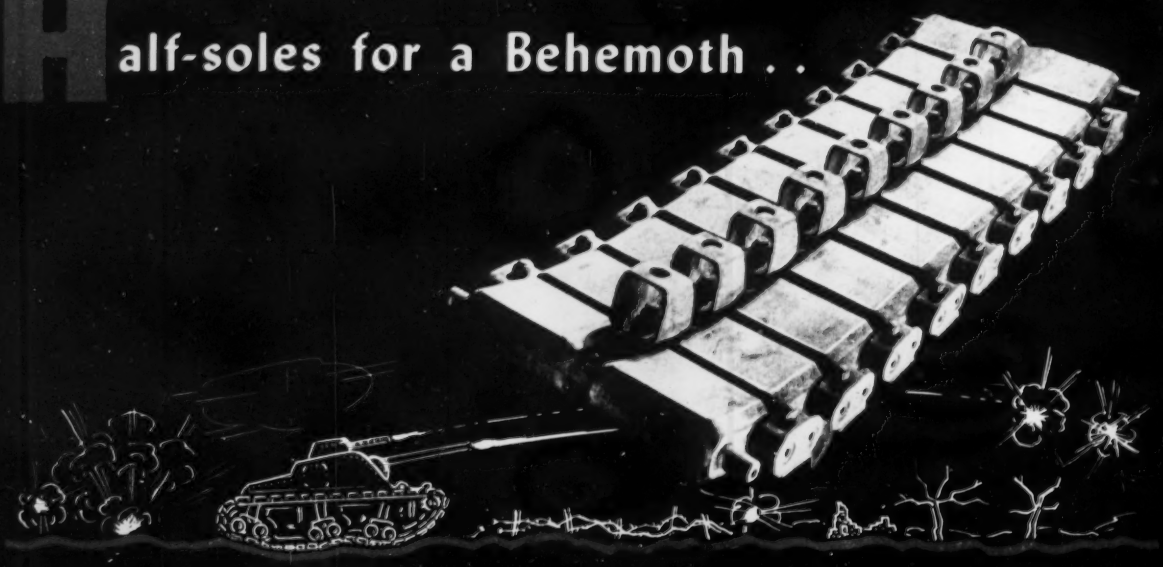
Half-soles for a Behemoth . .



SHARON* HI-STRENGTH STEELS DELIVER MAXIMUM STRENGTH FOR TANK TRACKS

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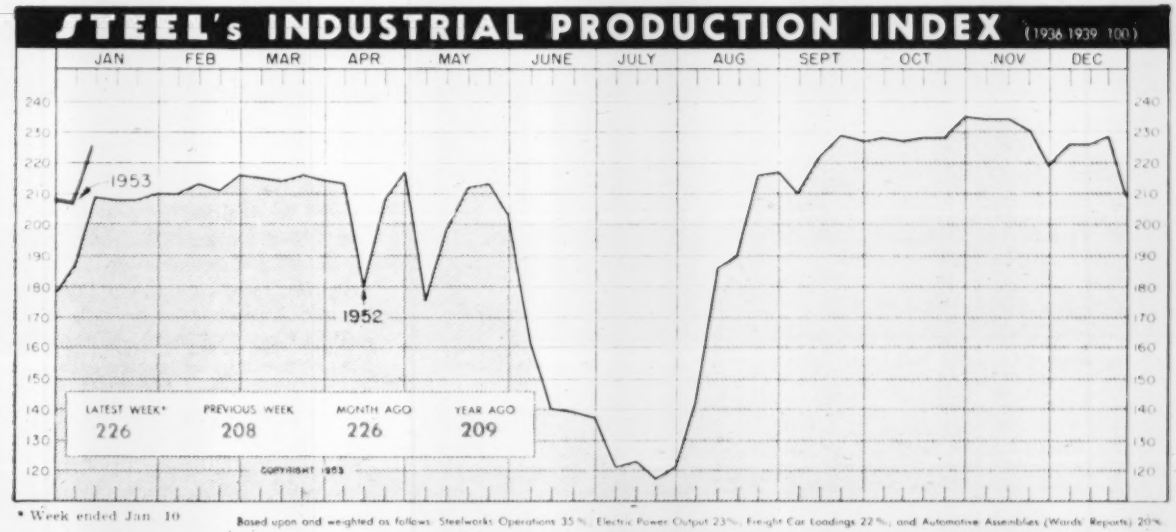
The Business Trend



* Week ended Jan. 10

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Wards' Reports) 20%.

Makers of civilian durables see good sales ahead, as consumer demand and personal income continue to rise. Industrial production index bounces back to pre-holiday levels

MANUFACTURERS of civilian-goods are preparing to smoke out many more consumer dollars in 1953. Sales optimism is flourishing among makers of civilian durables, in particular.

Behind the optimism are two significant upward trends: Rising personal income and the upcurve in retail sales volume started in mid-1952.

More to Come—Personal income on Dec. 1 remained at October's record annual rate of $276 million, despite the seasonal cutback in farm income, says the Office of Business Economics. Wage and salary disbursements in the year ended Dec. 1 rose 7 per cent to $187.9 billion annually. And wages and salaries are expected to continue rising, though less dramatically than in 1952, throughout the rest of this year.

Retail sales, the other big factor, started to improve in mid-1952 and kept moving upward to the end of the year. January sales volume is keeping above January, 1952, and many retailers expect volume to remain high this year. The National Retail Dry Goods Association after surveying 250 department and specialty stores, each with an annual volume of $1 million or more says that 75 per cent of these stores reported that their 1952 sales topped 1951, and 66 per cent of the stores expect their profits for last year to equal or surpass those of 1951. A continuance in the high sales volume is indicated in reports from the Federal Reserve Board, which says department stores are now taking in about 5 per cent more in dollar volume than in the comparable weeks in January, 1952.

Seasonal Rise—With both consumer and defense needs high, production machinery throughout the U. S. is humming. The red line on STEEL's industrial production chart jumped to 226 per cent of the 1936-1939 average in the week ended Jan. 10, the first full workweek in 1953. Automotive production and freight car loadings made the largest increases of the nation's prime industrial indicators.

New Record in Steel Output . . .

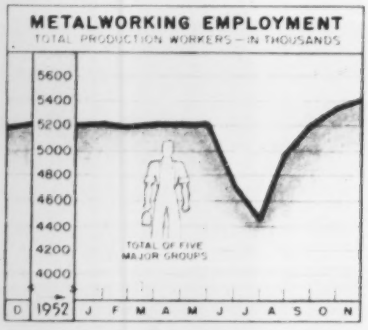
With new facilities going into operation and demand insistent, steel mills are breaking production records again. The American Iron & Steel Institute estimates that furnaces in the week ended Jan. 17 poured a record 2,240,000 net tons of steel for ingots and castings.

Trucks Rumble Faster . . .

The truck industry is planning to maintain strong production through the first quarter, at least. Off to a good start, truck manufacturers are expected to assemble around 110,000 units in January, or 6000 units over the high output in January, 1952. So says *Ward's Automotive Reports* which estimates first-quarter truck assemblies at well over the 314,891 trucks produced in the first three months of 1952.

Reason for the high scheduled production is the unusually strong demand for new trucks, particulary "lights." In 1952, demand for trucks held firm until early summer, when it fell considerably. When steel production resumed after the strike, the truck industry—faced with depleted dealers' stocks—started setting new output records for the year. But the truck industry found that customers kept ordering many units long after most of the gap was expected to be filled. And strong demand is continuing into the first quarter of 1953.

With passenger car demand also insistent, the auto-truck output of the U. S. and Canada is far over

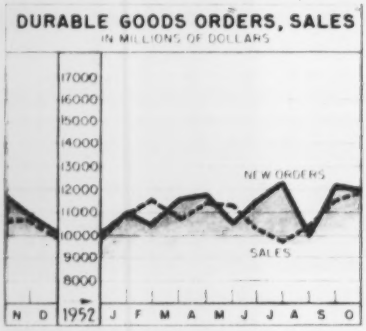


Metalworking Employment
In Thousands

Production Workers—Five Major Groups

1951	Prim. Mtls.	Fab. Prod.	Machinery	Elec. Mchy.	Trans. Equip.
Nov.	1,151	801	1,225	717	1,242
Dec.	1,165	806	1,270	724	1,238
1952					
Jan.	1,163	801	1,276	723	1,240
Feb.	1,160	805	1,280	726	1,243
Mar.	1,154	807	1,280	722	1,266
Apr.	1,143	806	1,282	714	1,288
May	1,141	798	1,269	708	1,307
June	716	765	1,261	706	1,323
July	676	726	1,203	685	1,169
Aug.	1,119	783	1,181	708	1,192
Sept.	1,154	820	1,186	743	1,311
Oct.	1,164	842	1,206	764	1,367
Nov.	1,173	856	1,226	788	1,372

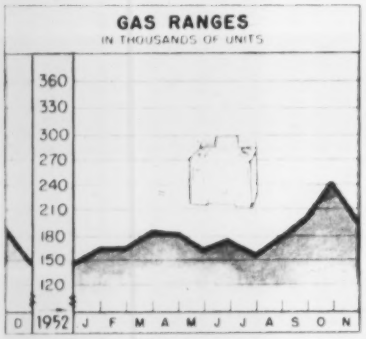
U. S. Bureau of Labor Statistics



Durable Goods Orders, Sales
In Millions of Dollars

	New Orders 1952	New Orders 1951	Sales 1952	Sales 1951
Jan.	11,287	15,060	10,941	10,130
Feb.	10,876	13,474	11,893	10,200
Mar.	11,712	15,542	10,743	10,861
Apr.	11,861	12,867	11,807	10,239
Mar.	11,712	15,542	10,743	10,861
June	12,423	13,267	10,060	10,383
July	11,393	12,235	9,777	9,666
Aug.	9,938	11,092	10,137	10,025
Sept.	12,165	10,311	11,510	9,505
Oct.	11,991	11,506	11,971	10,660
Nov.		11,031		10,712
Dec.		10,312		9,786

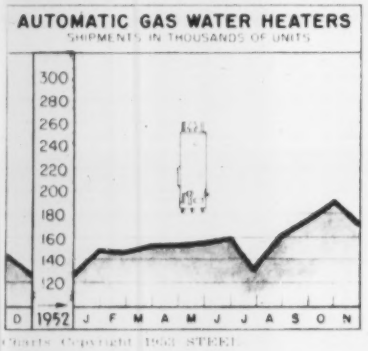
Seasonally adjusted. U. S. Office of Business Economics



Gas Ranges
Shipments in Units

	1952	1951	1950
Jan.	166,100	260,600	165,000
Feb.	166,200	244,000	266,000
Mar.	186,200	286,800	264,000
Apr.	182,300	225,000	239,100
May	162,800	177,800	242,800
June	175,700	128,500	217,000
July	134,200	116,100	254,800
Aug.	178,600	168,100	331,500
Sept.	196,600	183,600	287,000
Oct.	241,600	210,500	308,000
Nov.	192,800	192,200	269,100
Dec.		151,800	235,900
Total		2,348,000	3,023,200

Gas Appliance Mfrs. Assn.



Automatic Gas Water Heaters
Shipments in Units

	1952	1951	1950
Jan.	148,200	225,600	131,600
Feb.	145,800	213,400	156,500
Mar.	153,300	223,300	172,800
Apr.	143,300	196,400	176,100
May	155,300	167,400	196,200
June	139,000	131,500	207,100
July	131,300	102,400	197,300
Aug.	161,500	124,400	250,500
Sept.	177,300	130,900	222,600
Oct.	190,800	148,800	235,100
Nov.	169,100	143,300	206,000
Dec.		127,200	202,500
Total		1,931,200	2,363,100

Gas Appliance Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Nov. 24	Indus. Production	Dec. 22	Ranges, Elec.	Dec. 8
Employ., Steel	Dec. 15	Ironers	Dec. 22	Refrigerators	Dec. 8
Feb. Strike, Steel	Dec. 22	Machine Tools	Dec. 15	Steel Castings	Jan. 12
Foundry Equip.	Dec. 29	Malleable Castings	Jan. 12	Steel Forgings	Jan. 12
Furnaces, Indus.	Dec. 29	Pumps	Dec. 8	Steel Shipments	Nov. 3
Freight Cars	Dec. 29	Prices, Consumer	Dec. 1	Vacuum Cleaners	Dec. 22
Gear Sales	Dec. 22	Prices, Wholesale	Dec. 29	Wages, Metalwkg.	Nov. 17
Gray Iron Castings	Jan. 12	Radio, TV	Dec. 15	Washers	Dec. 29

production in the comparable weeks in January, 1952. In the week ended Jan. 10, U. S. and Canadian output totaled 139,446 passenger cars and trucks, or more than 50 per cent over the week ended Jan. 12, 1952.

Employment Dips Slightly . . .

Employment took a less than seasonal drop in December, as nonagricultural industries absorbed many agricultural, construction and other workers with seasonal jobs. The Commerce department says that total civilian employment by mid-December declined to 62.9 million from 63.6 in mid-November. Employment in nonagricultural industries increased 330,000 to 55.8 million, as both manufacturers and retailers scrounged for help. Despite a 1.1 million decline in agricultural jobs, unemployment throughout the U. S. continued declining as many workers withdrew from the labor force. Unemployment in December dropped to 1.4 million the lowest number of jobless since World War II.

Business Levels Off . . .

Business conditions in the Chicago area on Jan. 1 continued good, but failed to surpass the level set two months previously. That's the consensus of midwestern buyers surveyed by Purchasing Agents Association of Chicago. Production continued to increase for 31 per cent of the reporting companies, but profits in December moved downward as 23 per cent of the members reported declines and only 11 per cent said their profits had improved.

Inventories, for the first time in many months, started to climb in December. Deliveries by vendors continued to speed up, while materials prices showed some tendency to even out. Practically no change in buying policy occurred in December, with 76 per cent of the buyers purchasing 30-90 days ahead, and of the rest, the lead time for the majority being less than 30 days.

Profits Show Strike Recovery . .

Industry by industry recovery from the 1952 steel strike is perhaps the most interesting trend outlined in the Securities & Exchange

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[1]	98.0	98.5	96.5
Electric Power Distributed (million kwhr)	7,800[2]	7,713	7,665
Bituminous Coal Output (daily av., 1000 tons)	1,277	1,042	1,234
Petroleum Production (daily av., 1000 bbl)	6,580[3]	6,516	6,178
Construction Volume (ENR, millions)	$323.7	$185.0	$266.7
Automobile, Truck Output (Ward's, units)	139,446	106,102	92,735
TRADE			
Freight Car Loadings (unit, 1000 cars)	750[2]	563	743
Business Failures (Dun & Bradstreet, number)	163	89	164
Currency in Circulation (millions)[4]	$30,153	$30,424	$28,800
Dept. Store Sales (changes from year ago)	-5%	+57%	13%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,911	$16,384	$17,746
Federal Gross Debt (billions)	$267.4	$267.3	$259.5
Bond Volume, NYSE (millions)	$19.6	$12.6	$14.3
Stocks Sales, NYSE (thousands of shares)	9,845	7,400	8,331
Loans and Investments (billions)[5]	$78.5	$78.8	$74.2
United States Gov't. Obligations Held (billions)[5]	$32.5	$32.6	$32.2
PRICES			
STEEL's Weighted Finished Steel Price Index[6]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	216.0	215.4	234.9
All Commodities[7]	109.7	109.6	115.0
All Commodities Other Than Farm and Foods[7]	112.8	112.8	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939 = 100. [6]1936-1939 = 100. [7]Bureau of Labor Statistics Index, 1947-1949 = 100.

Commission's financial report on U. S. manufacturers in the third quarter.

Steel companies, of course, were the first to boost operations and their profits rose 15 per cent over the previous quarter to $127 million after taxes. Automotive companies, on the other hand, had enough steel to maintain high operations throughout most of the second quarter and were not severely crimped until the third; profits in the automotive industry plunged 24 per cent to $198 million in the third quarter. The nonelectrical machinery industry found its third-quarter profits had declined 18 per cent to $327 million. Makers of transportation equipment, excluding automotive, had their profits trimmed 3 per cent to $61 million.

Profits after taxes started upward for the electrical machinery industry and makers of fabricated metal products. Producers of electrical machinery in the third quarter boosted profits 7 per cent to $140 million, while companies producing fabricated metal products found that profits after taxes inched up 1 per cent to $129 million in the third quarter.

Freight Car Orders Low . . .

Orders for new freight cars are continuing at low levels, while car production rolls faster. The Association of American Railroads says that new orders for domestic freight cars in December totaled 1159 units, compared with 7845 freight cars produced that month. Industry backlog by Jan. 1 declined to 80,296 cars-on-order, compared with a backlog of 123,947 freight cars on Jan. 1, 1951.

Construction Awards Increase...

Contractors and architects who expected good business in 1953 are finding that construction awards are rolling in at a considerably faster pace than in early 1952. Contract awards for heavy construction, says *Engineering News-Record*, totaled $323.6 million in the week ended Jan. 8, or 21 per cent over awards in the week ended Jan. 10, 1952.

Trends Fore and Aft . . .

Business inventories in November rose to $75.5 billion, or $450 million beyond the usual seasonal increase, says the Office of Business Economics . . . Crude oil production is running 5 per cent greater than a year ago . . . Total wholesalers' sales in November had declined 7 per cent after retailers' shelves had been filled with holiday goods.

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Men of Industry

LYLE B. SCHUELER
. . . V. P.-sales, Diamond Power

Lyle B. Schueler was elected vice president in charge of sales, **Diamond Power Specialty Corp.**, Lancaster, O. He has been sales manager since the spring of 1950.

James D. Mooney was elected president of **F. L. Jacobs Co.**, Detroit, to succeed **Neil A. Moore** who became president of Jacobs last November. Mr. Mooney formerly held executive posts with General Motors Corp. and Willys-Overland Motors Inc.

Eugene A. March was appointed chief metallurgist for **Crucible Steel Co. of America's** Sanderson-Halcomb Works located in Syracuse, N. Y. He succeeds **David I. Dilworth Jr.**, made assistant director of metallurgy.

Streeter-Amet Co., Chicago, elected **Robert T. Isham** vice president, **Verne C. Kennedy Jr.** director of sales and engineering, and **H. W. Smith** supervisor of production.

Appointments at **Armco Steel Corp.'s** Ashland, Ky., Division are: **George Yost Jr.** as assistant general superintendent in charge of rolling and processing operations, a newly created position; **William Verity** to succeed Mr. Yost as assistant to the manager of the division.

BRUNO R. MUELLER
. . . Pittsburgh Steel tubular sales

Bruno R. Mueller was appointed sales manager, tubular specialties, **Pittsburgh Steel Co.**, Pittsburgh. He has been with the company since 1944 but last year was assigned to the National Production Authority where he served until recently as chief, tube section, Iron & Steel Branch.

Keystone Steel & Wire Co., Peoria, Ill., appointed **John L. Sanderson** superintendent of wire mills to succeeds the late **John Moritz. J. W. Mahannah** was made assistant to the superintendent, wire mills.

Dravo Corp., Pittsburgh, appointed **D. Russell Pearce** assistant purchasing agent, machinery division.

Harold D. Newell was appointed consulting metallurgist and **John J. B. Rutherford** chief metallurgist, Tubular Products Division, **Babcock & Wilcox Co.**, Beaver Falls, Pa.

Robert F. Carr Jr. was elected vice president, **Dearborn Chemical Co.**, Chicago.

J. C. Kuhn, formerly vice president and director-sales of Morse Twist Drill & Machine Co., was appointed vice president of sales, **Atkins Saw Division**, Borg-Warner Corp., Indianapolis.

GEORGE M. CARVLIN
. . . a Kopper's div. V. P.-gen. mgr.

George M. Carvlin, vice president and assistant general manager, was elected general manager, engineering and construction division, **Koppers Co. Inc.**, Pittsburgh. He succeeds **Joseph Becker** who retired as vice president-general manager of the division but continues as a consultant to the company.

Dwight W. Kaufmann was appointed assistant manager of sales, **Rem-Cru Titanium Inc.**, with office in Midland, Pa. Since 1950 he has been in Pittsburgh as a metallurgist in the central metallurgical office of Crucible Steel Co. of America, co-owner of Rem-Cru with Remington Arms Co.

Officers of **John A. Roebling's Sons Co.**, Trenton, N. J., a newly formed and wholly-owned subsidiary of Colorado Fuel & Iron Co., include: **Charles Allen Jr.**, chairman of the board; **A. F. Franz**, president; and **Charles Roebling Tyson**, executive vice president. Mr. Allen is chairman of CF&I, Mr. Franz is president, and Mr. Tyson served as president of the Roebling concern from 1944 until its acquisition by Colorado Fuel & Iron.

Hyatt Bearings Division, Harrison, N. J., General Motors Corp., appointed **C. W. Kalchthaler** assistant to the general sales manager

at Harrison. He previously was assistant manager, Hyatt motor division sales office, Detroit.

John R. Hersey was named assistant sales manager by **C. O. Bartlett & Snow Co.**, Cleveland. In this capacity he will assist in general supervision of all sales activities but will continue to head the company's coal handling department. **Harry C. Orr**, formerly assistant in the foundry sales department, was named manager, standard products and repair parts sales and service department.

C. L. Heater, vice president, **American Steel Foundries**, Chicago, will head the newly formed transportation equipment division, with **G. H. Snyder**, vice president, assisting in a staff capacity; **C. E. Grigsby** vice president in charge of sales; **E. A. Walcher Jr.** vice president in charge of manufacturing; and **R. B. Cottrell** chief mechanical engineer. **R. D. Brizzolara**, vice president, who heads the Elmes & King Division, will also be in charge of the newly organized Hammond Division, with **E. L. Krejci** as general manager; **R. W. Clyne** as sales manager, **M. W. Kraegel** as works manager-Hammond plant, and **C. E. Tack** as product engineering manager.

Hunter Michaels was elected vice president-operations, **American Locomotive Co.**, New York. **D. W. Cameron** was named vice president-manufacturing, and **Manuel Alonso** vice president-foreign sales.

G. KRAUSE
. . . chief designer of heavy presses

G. Krause was appointed chief designer of **Loewy Construction Co. Inc.**, subsidiary of Hydropress Inc., New York, in charge of U.S.A.F. heavy press program.

Robert McConnachie was appointed assistant chief combustion engineer for the Chicago district of **Republic Steel Corp.**

Harold Burnip was made director of purchases, **Lincoln Electric Co.**, Cleveland. He succeeds **J. S. Roscoe**, recently made executive vice president- business administration. **Norman Zollar** assumes duties of purchase engineering to succeed Mr. Burnip. **Arthur Walper** becomes manager, electrode division purchases and **William Toward** continues as manager, machine division purchases.

F. L. Bryant was named superintendent for the Niagara Falls, N. Y., plant of **Hooker Electrochemical Co. J. D. Sweeney** was named assistant superintendent - production.

United Wire & Supply Corp., Providence, R. I., appointed **A. T. Allan** manager, brazing product sales.

A. J. Hirons was appointed manager, **Bohn Aluminum & Brass Corp.'s** Plant 24 at Adrian, Mich.

Francis L. Schmale was promoted to general sales manager, **Double Seal Ring Co.**, Ft. Worth, Tex.

Warde B. Stringham was elected a commercial vice president, **General Electric Co.**, assigned to Washington. He succeeds **Edwin E. Potter**, Washington vice president, who retires after 43 years' service.

Dr. Philip R. Marvin was elected vice president, **Commonwealth Engineering Co.**, Dayton, O.

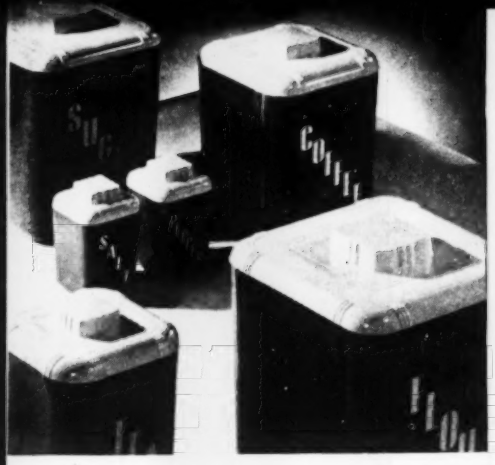
S. E. Biggs was elected vice president-operations, **Youngstown Steel Car Corp.**, Niles, O. Since 1950 he has been vice president-manufacturing of Trailmobile Inc.

Samuel K. Hostetter Jr. was named sales manager, **Crocker-Wheeler Division**, Elliott Co., at Ampere, N. J. For the last ten years he

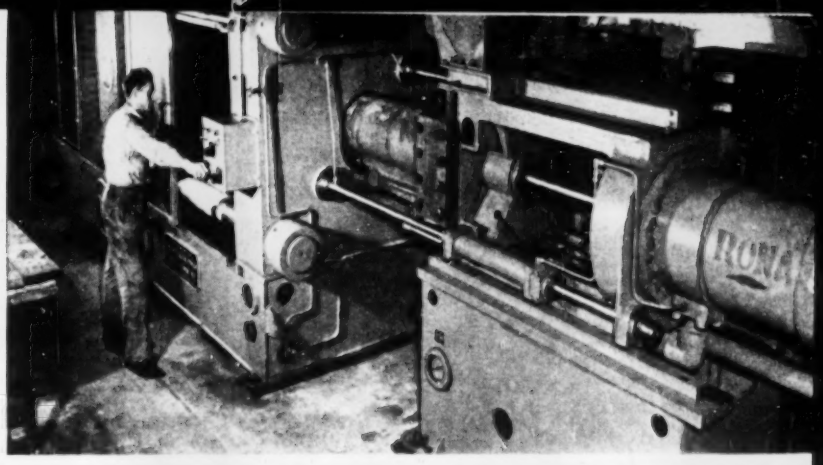
HUNTER MICHAELS
. . . American Locomotive V. P.

HAROLD BURNIP
. . . purchase dir., Lincoln Electric

SAMUEL K. HOSTETTER JR.
. . . Crocker-Wheeler sales mgr.



NO MORE PROBLEMS. The production of plastic household items by Rona Plastic Corporation was slowed down by an inadequate hydraulic oil. A switch to Sunvis 999, over a year ago, restored it to normal.



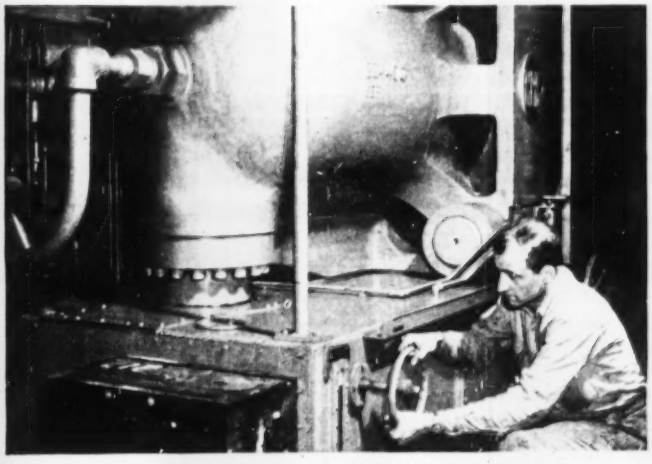
PRESSURE LOSSES ENDED. There are few plastic molding machines as big as this 60 ounce model. It exerts a pressure of 1,000 tons. Because the hydraulic oil formerly used sludged up and thinned out, it could not maintain this pressure. But Sunvis 999 has fully met these severe requirements, as well as those of Rona's nine other hydraulic machines of varying sizes.

PLASTIC MOLDER'S BOTTLENECK ENDED BY SUNVIS HYDRAULIC OIL

More than a year ago Rona Plastic Corporation, New York City, had trouble with its hydraulic molding machines. The machines functioned erratically due to oil sludge sticking the control mechanisms. In addition, the oil thinned out excessively at normal operating temperatures, and resulted in the loss of proper clamping pressures on the dies. To keep the machines going at all, it was necessary to drain, clean, and entirely recharge the systems at frequent intervals.

A Sun representative, called in by Rona, studied the problem and recommended Sunvis 999. He knew it would put an end to pressure losses, because, even at elevated temperatures, it does not decrease in viscosity as much as most other oils. He also knew its exceptional stability would end the sludging problem.

Sunvis 999 proved to be the answer to all Rona's hydraulic oil problems. The original charges, with minimum make-up, are still giving good service. Rona can expect the same performance for a long time to come, because experience shows that under normal operating conditions, Sunvis 900 Series Oils are *good for the life of the equipment.*



NO OIL CHANGES HAVE BEEN NEEDED. Before Sunvis 999 was adopted, the oil in each of the machines had to be changed frequently. (the one pictured holds 150 gallons). The original charges of Sunvis 999 have been in use now for more than a year.

Department S-1
Sun Oil Company, Philadelphia 3, Pa.

I am interested in knowing more about Sun Hydraulic Oils. ☐ I would like to consult with a Sun representative. ☐ Send the booklet "Hydraulic Fundamentals and Industrial Hydraulic Oils."

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. . . Standard Pressed Steel V. P.

JOHN F. WILSON
. . . wks. mgr. at Leland Electric

JOHN L. CAMPBELL
. . . V. P.-sales, Ohio Steel Foundry

has been manager of the Washington office.

George A. Gade, manager, outside sales, **Standard Pressed Steel Co.**, Jenkintown, Pa., was made vice president-sales. He succeeds to a post left vacant by election almost a year ago of **J. Whiting Friel** as vice president of the company.

John Poast was made superintendent of the newly established blast furnace department at the East Works of **Armco Steel Corp.'s** Middletown, O., division. **Edwin A. Kercsmar** becomes superintendent of the blast furnace at the Hamilton, O., plant to succeed Mr. Poast.

W. Walter Jablon was appointed vice president in charge of sales by **David Bogen Co.**, New York manufacturer of electronic equipment. He held a similar post at Espey Mfg. Co. with which he was associated for nearly 20 years.

John F. Wilson, formerly branch contract sales manager at American Machine & Foundry Co.'s Buffalo plant, was named works manager, **Leland Electric Division**, Dayton, O.

At **Republic Steel Corp.**, Cleveland, **Charles J. Reiter** was made assistant manager, general order department, where **R. D. Schad** is also an assistant manager. **James B. McConnaughy** succeeds Mr. Reiter as manager of orders for Republic's central alloy district in Canton and Massillon, O.

W. R. Lockwood was made manager of the Seattle steel service plant of **Joseph T. Ryerson & Son Inc.** to succeed **C. W. Summerville**, who has served as manager since Ryerson in 1951 acquired stocks and warehouse facilities formerly owned by Seattle Steel Co. and Inland Empire Steel Co. of which Mr. Summerville was a founder.

John L. Campbell was elected a vice president of sales at **Ohio Steel Foundry Co.**, Lima, O., the position formerly held by **T. H. Harvey** who became senior vice president.

Parker-Kalon Corp., New York, promoted **Eli Ogulnick** from controller to the newly created position of assistant general manager.

James W. Murphy was appointed manager of sales, stainless and alloy castings division, **Allegheny Ludlum Steel Corp.**, Pittsburgh.

Oscar E. Peterson was appointed manager, Indianapolis district sales office, Dallas Division, **Revere Copper & Brass Inc.** He succeeds **P. H. Anderson**, resigned.

T. H. Sheehan and **Eric G. Boehm** were appointed to the newly created positions of assistant managers of manufacturing of **Houdaille-Hershey Corp.**, Detroit.

OBITUARIES . . .

Clarence Snyder, 72, chairman of **Snyder Tool & Engineering Co.** and **Arthur Colton Co.**, Detroit, died at Ft. Lauderdale, Fla., Jan. 5.

Walter L. Maxson, 60, vice president in charge of research for **Oliver Iron Mining Division**, U. S. Steel Corp., Duluth, died Jan. 9.

Henry J. Sandblade, consulting engineer and vice president, **Thomas Flexible Coupling Co.**, Warren, Pa., died Jan. 5.

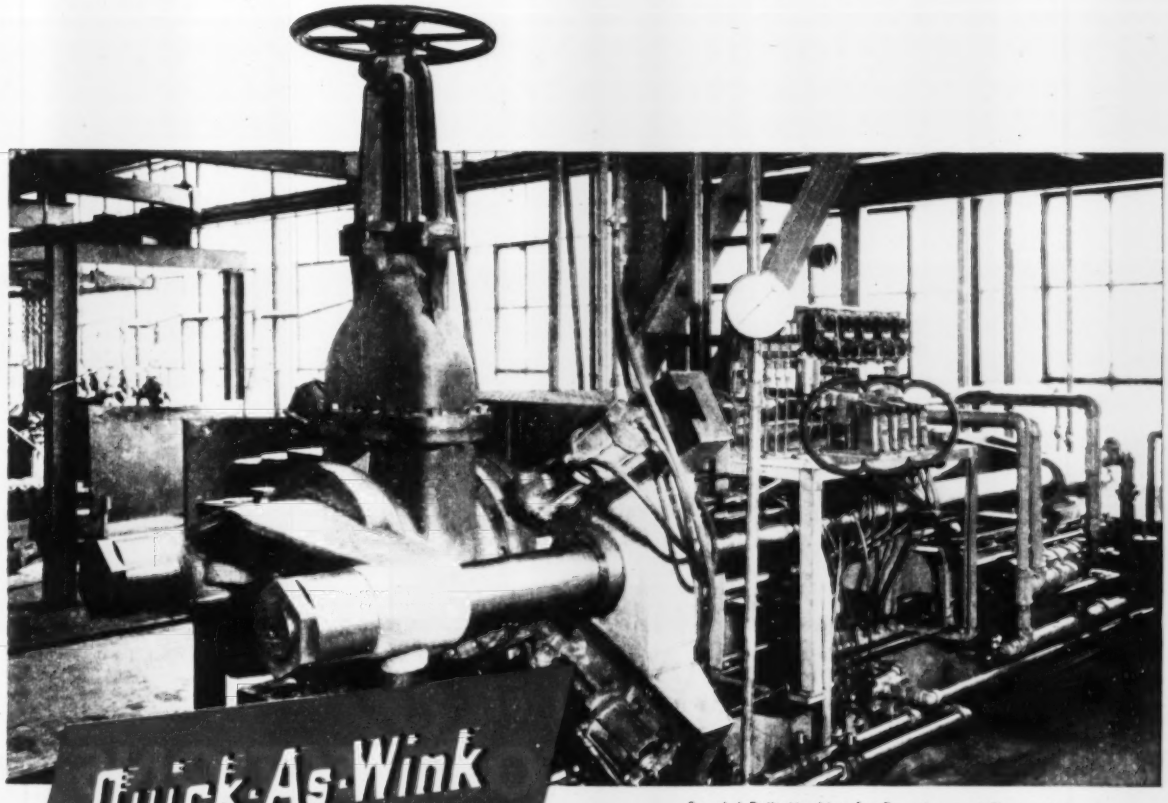
A. A. Batts, 68, former president and chairman of **Carborundum Co.**, Niagara Falls, N. Y., died Jan. 8 in Florida.

Frank M. Mason, 42, vice president, **U. S. Electrical Motors Inc.**, and general manager of its Atlantic plant in Milford, Conn., died Dec. 27.

G. M. Gillen, 50, manager of marketing service in the market development department of **Lukens Steel Co.**, Coatesville, Pa., died Jan. 7.

George W. Abel, 64, general superintendent, Indiana Harbor plant, **Youngstown Sheet & Tube Co.**, died Jan. 12 at his home in Chicago.

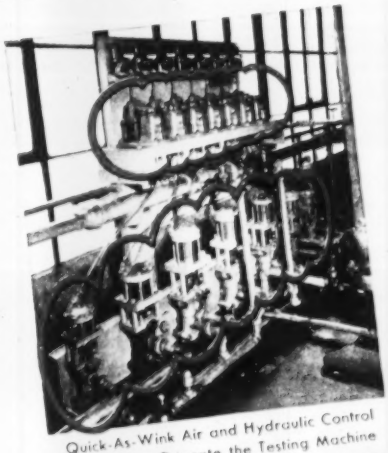
Crawford B. Murton, 66, retired works manager of **Inland Steel Co.'s** Chicago Hts., Ill., plant, died Jan. 5. He retired in 1951.



Special Built Machine for Exacting and Thorough Hydraulic Testing Heavy Duty Gate Valves

Quick-As-Wink Control Valves

industry wide recognition for unsurpassed dependability



Quick-As-Wink Air and Hydraulic Control Valves that Operate the Testing Machine Shown Above

We think steel men know most about steel; rubber industry men know most about rubber; machine builders know most about machines; and valve men know most about valves. So when a large nationally known valve manufacturer chose Quick-As-Wink control valves for the exacting and thorough testing of his own heavy duty valves (see photo) we're pleased — but not surprised, because throughout the steel, rubber, machine building, and most other industries, men with experience usually prefer Quick-As-Wink Control Valves. Positive and fast-acting, every valve is designed and built for maximum air economy and the long, dependable trouble-free service you want in your operations.

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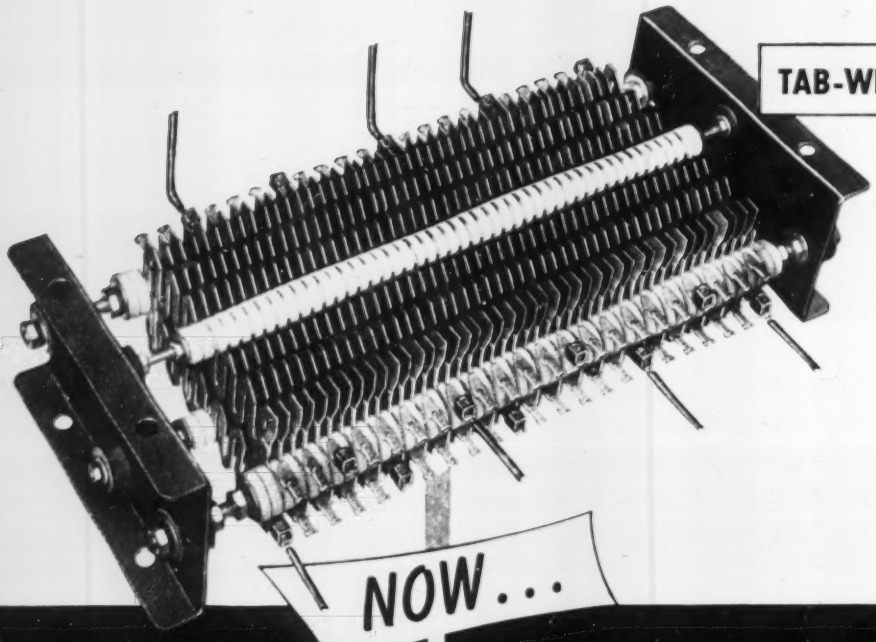

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Likewise efficiently designed are the individual grids, resulting in completely covering a plant's requirements with a *minimum* of sizes.

Remember, also, these EC&M TAB-WELD Resistors may be used "off-the-storeroom shelf." Many taps make on-the-job connections easy and readily permit small adjustments in resistance-value.

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Production AND Engineering NEWS AT A GLANCE

CURING SPEC HEADACHES—Basis for a new cross index of chemically equivalent specifications is a single five digit code number for ferrous and nonferrous alloys of similar composition covered by a variety of specifications. It provides a reference by which the material compositions of different specification may be compared. The Cross Index was developed by General Motors engineering staff under contract with the Office of Stabilization in cooperation with a joint Army-Navy-Air Force group. A realization of the increasing need of the metalworking industry for a complete run-down on metal specification led STEEL to undertake publication of a Specifications Handbook based on the above Cross Index. Metals included are: Steels and alloy steels, copper, nickel, cobalt, lead, tin, silver, aluminum, magnesium, zinc, bismuth and cadmium, antimony, platinum and alloys of these metals. Specifications in the Handbook are: U.S. Army, Aeronautical Standards Group, U.S. Air Force, Federal, AISI, SAE, Aeronautical Materials Standards of SAE, U.S. Navy, ASTM. It is by far the most complete technical guide on metal specifications ever assembled. p. 80

BIG SQUEEZE—An automatic hydraulic compressor installed by the U. S. Navy can compress gases to 100,000 pounds per square inch. It will facilitate the study of fuels behavior at gun pressure. Unique features of the device are an automatic hydraulic control and driving system and "liquid" pistons. Harwood Engineering Co., Walpole, Mass., produced the compressor for the Navy.

MODELS OF EFFICIENCY—Electric motors built for Atomic Energy projects by Westinghouse Electric Corp. achieve an efficiency of better than 96 per cent. The company received orders for about $10 million worth and a sizable number have already been shipped. Despite their power, the high efficiency motors are relatively small, weighing 16,000 pounds and standing 58 inches high. AEC power requirements make it necessary to get the most out of each power dollar, particularly since many of the motors will be kept on the line continuously.

SMOOTH OR NOT—Increasing attention is being paid to surface finishes but metalworking production men don't always agree as to what they want on various jobs. Yale & Towne Mfg. Co. has standardized surface finishes in order to eliminate confusion. Standardization doesn't produce better surface finishes but it does permit production men to ascertain when a desired surface finish is being produced without differences of opinon. Surface finish blocks set the standard for the entire operation and tolerances on any specified finish are interpreted usually as any finish better than specified and up to 10 per cent rougher. Unless it is specifically stated that the finish is to be produced by a certain method, the equipment used is left up to the discretion of the shop men. p. 74

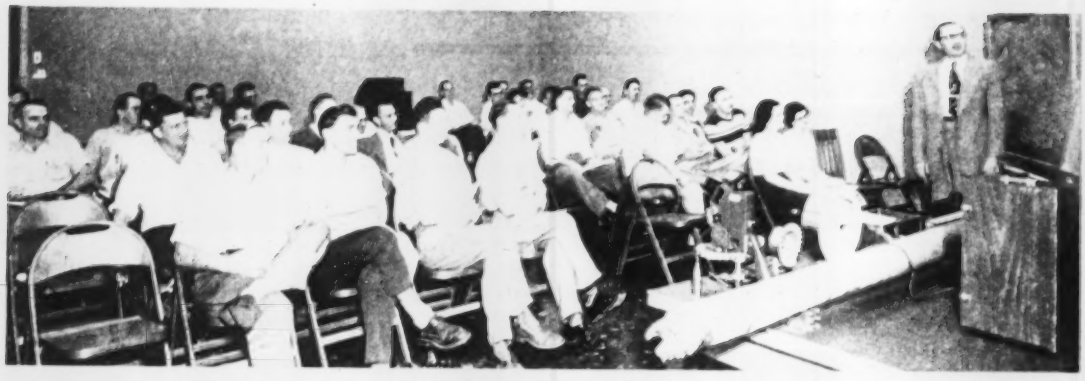
WHAT NEXT?—You can't underestimate the power of designers and engineers anymore than you can women. If you hear about appliance designs that may seem unconventional, don't make any rash wagers that they are impossible until after you've done a little checking. Latest wrinkle is a combination range and dishwasher. The makers of Universal gas ranges will have it on the market about Apr. 1. No installation, plumbing, wiring or cabinet work are required. What will you bet that the lady of the house doesn't buy one?

FOOT COMFORT—A heated standing mat for workers has been field tested and a western coal mine operator is installing them in locomotive cabs. Operating on a standard 110 volt current, the mat has a center layer of electrically conducting rubber constituting the heating element. Neoprene is used for the mat because of its excellent wear qualities and resistance to deterioration by oil and heat.

READY ANSWERS—A fast access memory using both electronic and magnetic techniques, capable of storing and releasing numbers at rate of 50,000 per second, was built for the Army by Burroughs Adding Machine Co. The device ties in with the Army's ENIAC digital electronic computer installed at Aberdeen Proving Grounds. The computer remembers a maximum of 20 numbers in its vacuum tube circuits and the overflow is transferred in code to punch cards. These cards refresh the device's memory slowing down the process. The new unit increases the memory power six-fold, enabling it to deal with bigger problems without consulting notes and speeding computation.

TITANIUM TUBING—Holding up use of titanium tubing in hydraulic fuel lines of jet engines is low flarability and ductility, says Audrey M. Bounds, chief metallurgist, Superior Tube Co., Norristown, Pa. The tube can't be flared enough to fit standard AN fittings without cracking. Another possibility for titanium tube is in valve push rods for reciprocating engines. First titanium tubing production at Superior was welded and drawn. Now the company is getting into seamless, is trying to develop techniques to replace deep drilling bar stock and cold drawing. Present size range is 1¼-inch OD x 0.083-inch wall and down in Weldrawn tubing and 1¼-inch OD x 0.125 and down in seamless tubing.

Metalworking Outlook p. 37 Market Outlook p. 119



A. A. Goodman, manager, quality control, Yale & Towne Mfg. Co. leads symposium introducing surface finish control

How You Can ...SPECIFY SURFACE FINISHES

When you set dimensions and tolerances on length, width and breadth—everyone knows what you mean. Now you can also be understood when you specify surface finish

SURFACE FINISH interpretation varies widely from plant to plant, between departments in any one plant and even between any two individuals in one department.

It's the old question of just how smooth is smooth.

No greater differences of opinion over any matching procedure exist than when the subject of roughness, smoothness or surface quality of a finish is under discussion. Everyone has his own opinion. Discussions often end in arguments.

Here's what one company is doing to clarify the meaning of surface finish as a part of their quality control program.

At Yale & Towne Mfg. Co. surface finishes are standardized. This does not mean that better finishes are produced. It does mean that they can ascertain, without differences of opinion, when a desired finish is being produced.

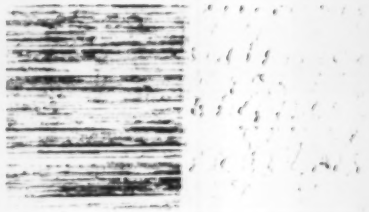
Here's How—Surface finish control depends on methods of conveying information on drawings and in specifications. The surface finish symbol on a drawing means that the surface touched by the heel of the symbol is to be finished to correspond to a master finish block of a similar roughness.

The number shown in the symbol means that the desired surface is to correspond to the microinch finish block of that number. For example, if the number, 63, is shown in the symbol the finish must correspond to the 63 microinch master finish block.

The microinch designations used at Yale & Towne are 2, 4, 8, 16, 32, 63, 125, 250, 500, 1000. These are standard for many industries. Tolerances on any specified finish are interpreted usually as any finish better than specified and up to 10 per cent rougher. Thus, the 63 microinch finish symbolized above is acceptable if the Profilometer reading is anywhere between one microinch and 70 microinches.

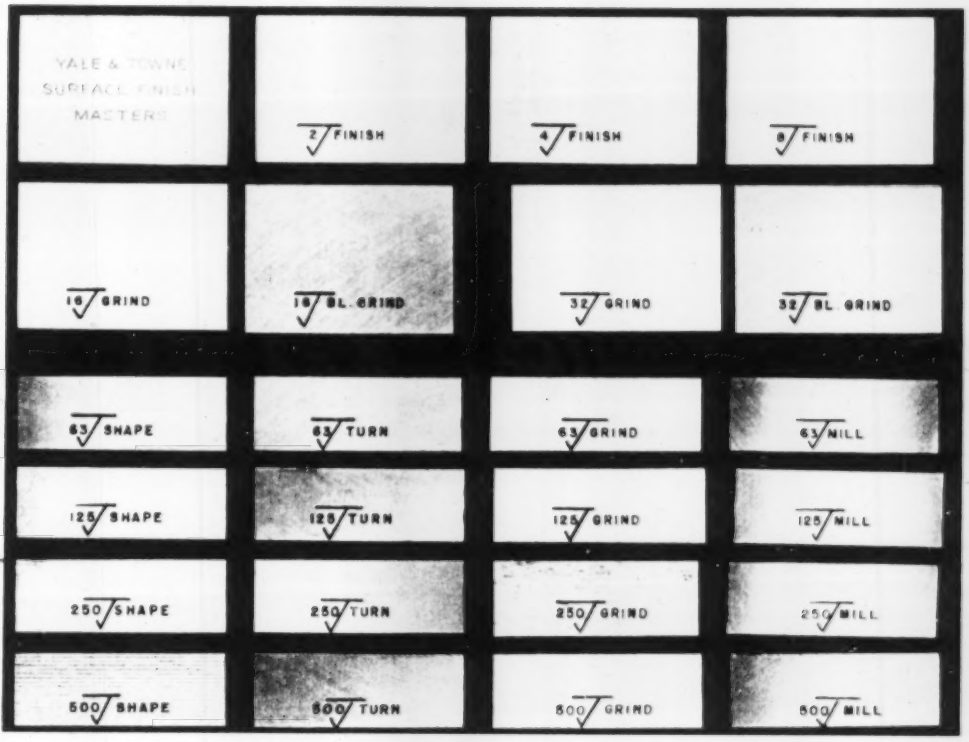
In some rare cases it may be desirable to have a finish with a specified roughness and not any smoother. The symbol will then have two numbers, such as $\frac{63}{32}$, which means no smoother than 32

(Top) Turned surface magnified 100 times shows tool furrows and edges; (bottom) profile magnified 62 times



Shaped surface (right) has evenly spaced tool grooves; ground surface (left) has no consistent surface pattern

Profile of turned journal before grinding. If used as a load-bearing surface tremendous pressures would build up at peaks to rupture oil film. Bearing failure would follow shortly



Standard finish blocks produced by same or nearest similar method to that used in the operation are preferred

microinch and no rougher than 63 microinch. Unless it is specifically stated that the finish is to be produced by a certain method, such as grinding, shaping, polishing, turning, the method used is left to the discretion of the shop personnel.

Standard finish blocks used are any recognized standard blocks. This follows the practice established for dimensional blocks (popularly known as Jo-blocks) which are supplied by different manufacturers.

Standard finish blocks are produced by various machining methods. It is preferable to use the block that is produced by the same (or the most nearest similar) method to the one used for the particular operation.

Yale finds that running the fingernail backwards over the standard block and over the work serves as a good comparator to work with. If any doubt exists a measuring instrument, such as the Profilometer, is used to produce numerical values. Actual measurements provide assurance that finish specifications are being met.

The table shown below serves as a guide in correlating Yale finish marks with the approximate corresponding microinch finish designation.

Surface Markings—Machine finish refers to the smoothness or roughness of the irregularities produced on the surface of the parent material by the cutting action of the method of material removal. Turning and grinding are two examples.

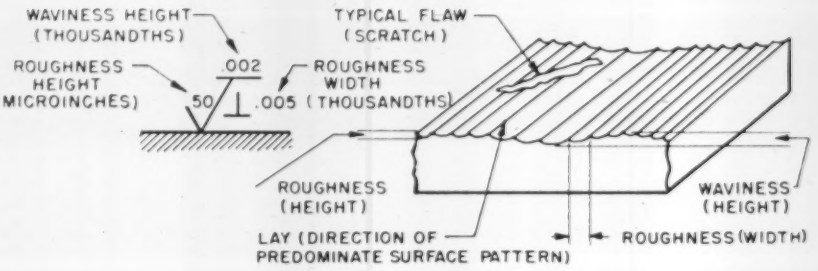
Turned, shaped, milled, broached, drilled and reamed finishes are produced by a pointed tool moving forward. As the point of the tool is traversed across the work, it will produce a surface leaving its own peculiar markings.

Y. & T. DRAWING FINISH MARKS	MICROINCH SYMBOL	DESCRIPTION
f	125	GOOD MACHINE FINISH
ff	63	FINE MACHINE FINISH
G	32	FINE GROUND FINISH
GG	16	EXTRA FINE GROUND FINISH
RG	500	HAND GRIND
RT	500	ROUGH TURN

This table is a guide in correlating Yale & Towne finish marks already in use with their corresponding microinch finish designations

SURFACE FINISH TERMINOLOGY

With the adoption of standard finish designations rapidly becoming universal, certain terminology is recognized as official. Here the most commonly used ones are explained



LAY Direction of the predominant surface pattern. On a turned or ground cylindrical object, the lay is circumferential. A surface grinder leaves a lay duplicating the direction of the table motion. A shaped surface's lay would duplicate the direction of the tool motion. A lapped surface, being a multimotion produced surface has no predominate pattern and thus has no lay. The drawing symbols for lay are indicated by the lay symbol placed under the extension to the right of the long leg as illustrated.

When measuring the surface roughness with a Profilometer or similar instrument (surface analyzer) measurements should be taken in the direction of the lay wherever possible, unless for special reasons it is specified otherwise.

ROUGHNESS A measure of the height and width of finely spaced surface irregularities. On surfaces produced by machining and abrading operations (grinding, lapping etc.) the irregularities produced by the cutting action of tool edges and abrasive grains and by the feed of the machine tool are roughness. Roughness may be considered as superimposed on a wavy surface.

Roughness is a recurrent irregularity typical of the surface. It normally covers the total surface, determines its suitability for specific applications. As already noted, roughness *width* is specified to the *right* of the *lay* symbol. Roughness *height* is measured in microinches., (millionths) of an inch and is specified in the *left* hand leg of the symbol.

Roughness height is the one used predominately to specify the surface finish desired. It is the symbol you will find used in the majority of cases where any surface finish designation is given.

MICROINCH Equals one millionth of an inch. Thus 63 microinches equal 0.000063-inch.

WAVINESS A measure of surface irregularities which are of greater spacing (pitch) than roughness. Waviness may be viewed as superimposed on a theoretically perfect surface. Such irregularities may result from machine or work deflections, vibrations, etc. Irregularities of similar geometry may occur due to warping or strains.

Waviness has two ratings, width and height, and of these the width is not usually given on drawings. Waviness height is specified in thousandths of an inch (0.002, 0.005, 0.009, etc.) These measurements are maximum peak to valley height. Waviness usually takes the form of smoothly rounded curves.

Waviness may be measured by a straight edge for coarse or large heights. For finer or close toleranced heights, dial indicator is required. The dial indicator should be equipped with a 1/32-inch radiused point or a 1/16-inch ball. Waviness will be the maximum reading

---

Regardless of what method of tooling is used, removal of stock by a pointed tool follows certain consistencies. The cutting tool does not actually cut the metal, in the true sense of the word. Instead, it fractures and pushes the metal off leaving behind it a surface consisting of furrows each of which in itself contains an infinite number of hills and valleys whose surfaces consist of fragmented material.

The mechanism can be visualized something like this: During the machining operation, a build-up edge of highly compressed metal forms in front of the tool. When the stress of the tool becomes great enough, this compressed material shears off and forms a part of the chip. Another compressed edge builds up immediately and is in turn sheared off. This process continues as long as the tool is cutting. The surface left in back of the tool therefore consists of infinite fragments of built up edge.

Pushes Them Down — High speeds and feeds result in tremendous pressures at the point of contact which will burnish the surface and give a high polish even to a very rough cut. This polish, however, does not eliminate the rough surface and the fragmented metal edges. It simply pushes them down, smears, and burnishes them.

Smoother — A ground surface generally has a higher polish than a tooled finish. The high heat generated by the grinding wheel at the point of contact approaches the melting point of the material being ground and is sufficient to smear, flow and plasticize the torn fragmented metal. This gives a finish with a high polish and mirror-like reflecting surface.

Under a microscope, however, a ground and even a honed surface will appear rough. A bright surface on metal is not necessarily a smooth one. A hand lapped extra fine finish will not possess the eye-appeal of a much rougher but shinier finish.

How does a ground and shaped surface compare? The shaped surface has definite, evenly spaced tooled grooves covered with torn, fragmented, sharp edged metal

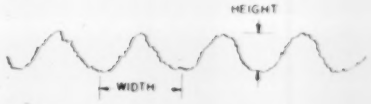
Parallel to boundary line of surface indicated by the symbol

Angular in both directions to edge

Finish of surface touched by heel of symbol corresponds to 63 microinch master finish block

Perpendicular to boundary line of the surface indicated by symbol

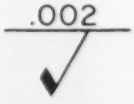
Approximately radial relative to center as designated



Surface profile with waviness, height and width shown. Roughness superimposed on wavines,

Multi-directional example: Lapped finish. Roughness may be measured in any direction

Approximately circular relative to center: Example: Phonograph finish on a flange



Waviness height value, when required, is placed above the horizontal extrusion line

LAY DESIGNATION

minus the minimum one over a travel of one-inch unflawed surface.

Gage blocks and certain ultra-flat surfaces such as thrust collars are measured for waviness by using a monochromatic light and quartz optical flats which measure extremely small surface variations from the nominal.

Waviness value in inches may be additionally specified, when required, by a percentage bluing note such as 90 per cent indicating that the surface shall show a certain per cent contact when coated and rubbed against a surface plate, straight edge, bluing gage or mating surface.

Waviness height value is placed about the horizontal extension line on the symbol.

FLAWS Irregularities which occur at one place or at relatively infrequent intervals in the surface. Example: Scratch, ridge, hole, peak, crack or check. Effect of flaws on the usefulness and usability of a part is not considered at all by the general microinch finish. There is no symbol for flaws.

peaks. The pitch of these grooves is governed by the feed and may be considered as consistent. These grooves as a rule extend the full length of the workpiece as shown in photograph.

A ground surface shows a different pattern. The grooves are closer together, the groove or scratch length is less, and individual abrasive grains cut their pattern deeper, shallower, wider or narrower as the case may be. There is no definite or consistent length or width to these grooves in grinding; the surface produced still consists of fine but torn, sharp-edged peaks and valleys.

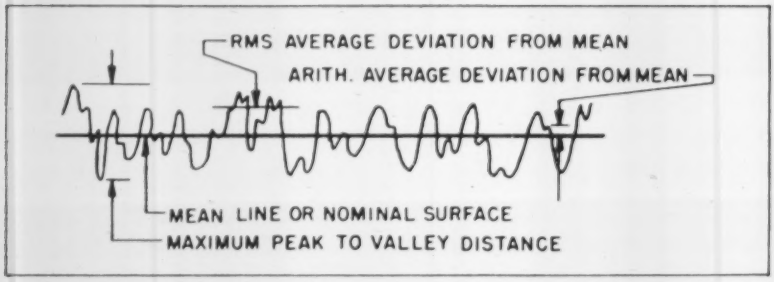
Finish Important — Functional requirements for parts generally permit a certain range of surface finishes to be satisfactory. A number of machining operations may be used within that range. The choice may be based on the equipment available within the shop or perhaps on the machine needed to produce the component.

As modern machinery of all types is progressing towards smaller, speedier more powerful, lighter units that will require less or even no wear full recognition must be given to the importance of surface roughness.

An area that must withstand great strain should have a good surface finish. Among such areas are radii at change of section diameter in spindles and gears. Where the stresses are exceptionally high, any appreciable roughness will increase the stress concentration considerably and failure may result. Good surface finish allows maximum bearing area to be obtained and small unit pressure.

How To Measure—The instrument used for surface finish measurements at Yale & Towne is the Profilometer. This equipment consists essentially of a diamond point with a spherical radius of 0.0005-inch embodied in a tracer pickup that is moved over the surface being measured. It transmits the surface irregularities to an amplifier that shows, on an electric meter, the surface roughness in microinches root-mean-square.

It would be comparatively simple to measure the roughness if


RMS AVERAGE DEVIATION FROM MEAN
ARITH. AVERAGE DEVIATION FROM MEAN
MEAN LINE OR NOMINAL SURFACE
MAXIMUM PEAK TO VALLEY DISTANCE

Rms average of all the peaks and valleys is about one-third that of the maximum peak and valley measurements as illustrated for this surface

the surface formed a true geometric wave such as a sine wave. The peak to valley height in microinches would suffice for most cases.

However, surfaces do not run that true and the peak to valley dimensions would be difficult to establish because of the ever varying assortment of peaks and valleys encountered. The mechanical engineering societies have decided that a more practical mode of specification is a value given to the deviation, plus or minus, of these hills and valleys to a theoretical nominal or mean surface line. This can be likened to the pitch diameter on a thread or gear.

Figures Can Lie—An arithmetical mean would not be a true picture because engineers are more concerned about the damage the higher or extreme peaks may do than the small ones. Thus, it is important to add more weight to the major peak measurements than the minor ones. A root-mean-square average gives this kind of a picture.

Wavy line, A-B, in illustration, represents a minute portion (two waves only) of the actual profile of a machined surface. The rms value is calculated by first drawing a straight line parallel to the plane of the surface being measured, at a depth which equally divides the areas between it and the peaks and valleys in the finished surface. This is the mean (or datum) surface line.

Datum line is divided into a number of equal segments and each segment is measured and tabulated. Each value is squared and the square root of the average (mean square) is the root-mean-square of the surface roughness. The rms value is larger than the arithmetical average.

Rms Profilometer readings are not peak to valley readings but average or mean values. These Profilometer rms readings can be translated to approximate peak to valley values if desired by multiplying rms readings by 3.5.

On surfaces measured by a Brush Analyzer, which measures the peak to valley height in microinches, dividing by 3.5 gives the equivalent to a Profilometer reading.

May Cost No More—Better surface finishes are all too often confused with more expensive finishes. Such is not the case. A 4 microinch finish, properly tooled up, may cost far less than a 32 microinch finish. Attention paid to the best method of metal removal will pay-off in better finishes at lower cost.

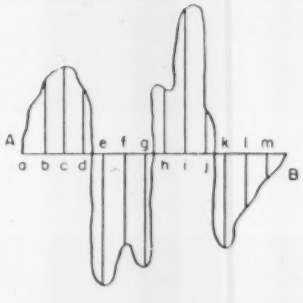
One manufacturer was finishing huge water wheel thrust collars by machine lapping to a "GG polish" finish. After lapping for some 80 hours the collar was usually accepted and the finish was in the order of 32 microinches. They found by measuring the surface every 15 minutes with a Profilometer that the finish became progressively better. After 8 hours the finish was 8 microinches. After that point finish became worse.

Lapping removes the microscopic layer of fractured, smeared steel which previously is left by the cutting tool on the base metal. This fractured layer will not necessarily be destroyed nor will it be completely removed from the base metal. It will, however, be crushed, cut, broken and otherwise disrupted and removed by the lapping operation.

As the lapping continues, a certain point is reached when the predominant amount of these peaks are leveled off and that is the time to stop. The finish at that point is as good as is desired. Continued lapping will cut into the base metal and from that point on the finish becomes rougher instead of better. Prolonged lapping will again give in rotation, better, worse, better, worse, etc. finishes.

By applying a precise surface finish instrument to this job the manufacturer now gets in one-tenth the time a finish of one-fourth the former roughness.

There can be no arguments on the characteristics of the surface finish in this case since the instrument gives a precise measurement of the surface roughness.



a - 3	a^2 - 9
b - 17	b^2 - 289
c - 25	c^2 - 625
d - 20	d^2 - 400
e - 30	e^2 - 900
f - 21	f^2 - 441
g - 26	g^2 - 676
h - 18	h^2 - 324
i - 35	i^2 - 1225
j - 11	j^2 - 121
k - 25	k^2 - 625
l - 18	l^2 - 324
m - 4	m^2 - 16
TOTALS 253	5975

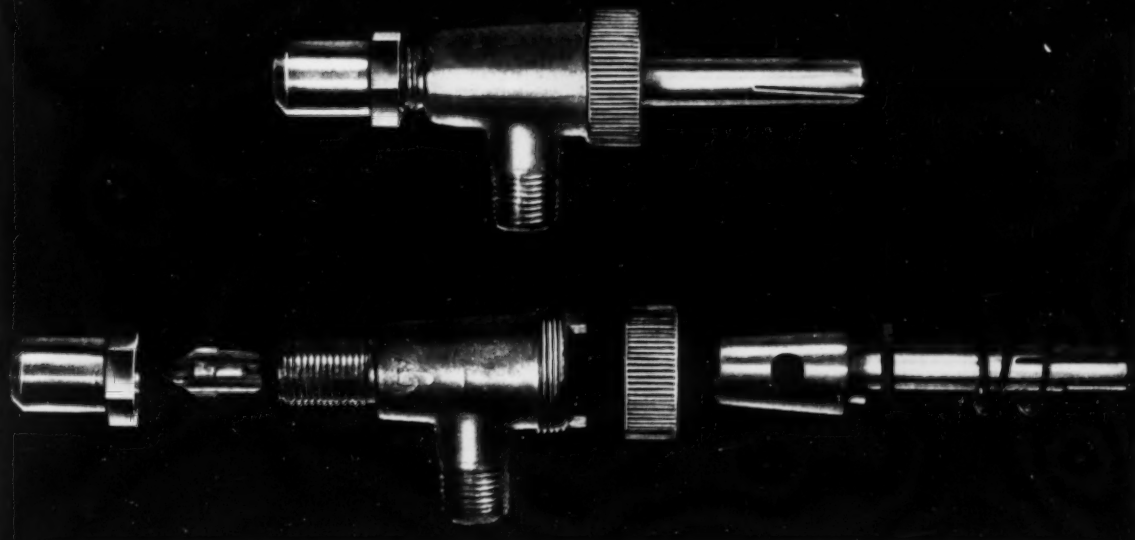
ARITHMETICAL AVERAGE = $\frac{253}{13}$ = 19.5 MICROINCHES

ROOT MEAN SQUARE AVERAGE = $\sqrt{\frac{5975}{13}} = \sqrt{459}$ = 21.4 MICROINCHES

Wavy line, AB, above represents a minute portion (two waves only) of the actual profile of a machined surface. Rms value is calcuated as shown

LINCOLN FINDS

Brass is Best



Kitchen range burner valve by Lincoln Brass Works, Inc., Detroit 16, Mich. Two different brasses are used in this valve, which is entirely of brass except for the washer and spring. Lincoln also makes valves for heaters and furnaces; flow, drain and shut-off valves for gasoline lines; shut-off valves for agricultural sprayers, and a wide variety of tube and pipe fittings, all entirely or chiefly of free-cutting brass rod and free-machining brass forgings.

Mr. D. E. DuPerow, Vice-President of Lincoln Brass Works, Inc., recently said: "Thirty-six years of brass use by Lincoln and complete acceptance by the trade is the best reason I can think of for brass superiority. If there had been any material better for our purpose, less expensive to fabricate, and more desirable to our customers, we would be using it now."

Brass has many desirable characteristics. Here are five of them that are important in Lincoln valves and fittings: 1, corrosion resistance, which means no plating is required. 2, high speed precision machining for high output, lower costs. 3, sound, non-porous structure of rod and forgings. 4, smooth performance; brass holds lubricants. 5, customer satisfaction; gas range burner valves pass the cycling test of being raised to 425°F. and back to room temperature a minimum of 10,000 times without seizure, loss of free operation, or leakage.

There are many other items besides valves that can profitably make use of the fine qualities of Revere Brass. The Revere Technical Advisory Service will gladly cooperate with manufacturers on the selection of the correct brass and its fabrication. Just call the nearest Revere Sales Office; see your telephone directory. Or write direct.

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Here's How To

Untangle Metal Specifications

NEW CROSS INDEX of chemically equivalent specifications will save production and engineering time. It will help you correlate industrial and military identifications

By DR. ALLEN G. GRAY
Technical Editor

DO YOU need help in untangling steel and nonferrous metal specifications?

Is confusion about the various specification systems costing you valuable production and engineering time? Perhaps you need a place to turn for leads on substitution of materials.

Then you will be interested in the new Cross Index. It provides a reference by which the material compositions of a wide variety of specifications may be compared.

Toward Common Denominator—Value of a common denominator to which all specifications can be reduced on the basis of composition was first realized at the outset of World War II.

At that time the material requirements program of World War II CMP, made wide and intensive use of specifications necessary. Also, the military nature of many of the products introduced the specifications used by the various armed services to a degree never before attained. Keep in mind this fact: Each of the services has its own specification system which in many cases leads to duplication.

That is, one branch may have several numbers or terms to indicate a particular alloy and another branch still different numbers to indicate the same alloy. In turn, this same alloy may have still a different designation by each of the several engineering societies.

This situation exists for almost every widely used alloy.

Here's the Start—To reduce the confusion resulting from the numerous specifications systems, a meeting was called by the statistical section of the War Department in June, 1942, to discuss the possibility of a cross index and coding system proposed by the Air Force and industrial concerns such as General Motors, Chrysler, and Ford. The result: General Motors assumed the major responsibility for developing a Cross Index code covering all commonly used specifications.

The first Cross Index appeared in 1943. A revision was made available in March 1945.

New Cross Index—Work on a more complete and revised Cross Index was started early in 1952 by the General Motors engineering staff under contract with the Office of Standardization in co-operation with a joint Army-Navy-Air Force group. Late 1952 saw approval of the manual by the Office of Standardization, Department of Defense.

Basis of the Cross Index is a single five-digit code number for ferrous and nonferrous alloys of similar composition covered by a variety of specifications. It thus provides a reference by which the material compositions of different specifications may be compared.

The materials covered by the specifications included in the new

TABLE I

CODE NUMBERS USED FOR CLASSIFICATION OF METALS AND ALLOYS IN CROSS-INDEX OF CHEMICALLY EQUIVALENT SPECIFICATIONS.

01000-09999	Steel code numbers. Absence of suffix indicates nominal composition is same as corresponding SAE-AISI specifications. The letter "T" suffixed to a code number indicates that such a number does not appear in the SAE-AISI list. In order to provide a uniform five-digit system a zero has been placed in front of the standard SAE-AISI designations.
The range 00000-00999 has been reserved for assignment and internal use by using agencies to cover analyses for which there are no code numbers presently assigned.	
10000-12500	Copper and Copper-base Alloys.
13000-13500	Nickel and Nickel-base Alloys.
13501-13600	Cobalt and Cobalt-base Alloys.
14000-14500	Lead and tin and alloys.
14750-14850	Silver and Silver-base Alloys.
20000-20999	Aluminum and Aluminum-base Alloys.
21000-21500	Magnesium and Magnesium-base Alloys.
23500-23600	Bismuth or Cadmium and Alloys.
23800-23850	Antimony and Antimony-base Alloys.
23900-23950	Platinum and Platinum-base Alloys.

Cross Index are the ferrous and nonferrous metals and alloys. In some cases specifications for products, such as rivets, piston rings, etc. are also given. Such products are included only in those instances where the specification lists in detail the material composition for the parts rather than calling for a specific material.

In the Cross Index each specification is assigned a code or group number which is common to all other specifications for material of similar chemical composition. For purposes of general classification of the metals and alloys, blocks of code numbers used are as shown in Table I.

Chemical Composition — In the first part of the Cross Index, groups of specifications for material of similar chemical composition are arranged in the numerical order of the code number assigned to each group of such specifications. Four items of information are listed for each specification:

1. Specification designation or symbol.
2. General form or shape of material specified.
3. The initial which designates the agency which issued the specification.
4. Detail chemical composition expressed as percentage by weight of the material required by the specification.

Specifications Listed—The second part of the Cross Index lists specifications for ferrous and nonferrous metals. The specifications issued by each agency are listed separately. Table II shows specifications included in the Cross Index. They are listed in alphabetical or numerical order along with the following information:

1. Specification designation or symbol.
2. Code number which has been assigned and which serves to index the specification in Part I.
3. The complete title of the specification.

Federal specifications are prepared for supplies used by the several departments and independent establishments of the federal government. The specification symbol used is composed of three elements: 1. The group of materials or supplies to which the specification relates; 2. the initial letter of

Industry Comments Indicate Need For This Type of Cross-Index

Purchasing Agent, Electrical Mfg. Co.—

"... very helpful in the substitution of materials. Would appreciate two or three copies for our Planning Department."

Superintendent, Aircraft Manufacturer:

"A wonderful source of reference in the Production Development Laboratory Chemical Section."

West Coast Manufacturer—

"It will be used as an aid in material call outs. If most modern materials and identifications are incorporated, it will be of great help."

Chief Metallurgist, Automotive Parts Company—

"We are interested in this Specifications Handbook as a reference guide in running ferrous and nonferrous analysis."

Manager, Steel Contractor

"It will be a great help in identifying materials specified in Government contracts on which we estimate from time to time."

Purchasing Agent, Camera Mfg. Co.—

"This handbook should prove most helpful in checking on various Government specifications we are required to meet in handling our Government work."

President, Machinery Manufacturer—

"After seeing concrete examples of the use of this cross-index, we feel an urgent need for it."

Engineering Aide, Naval Shipyard—

"This cross-index will be of inestimable value in identifying various metals and will be used extensively in the U. S. Naval Shipyard Welding Engineering Section."

Owner, Heat Treating Co.—

"We are engaged in the commercial heat treating business and have been trying to locate information which would give us the comparisons of American Society of Testing Materials Specifications to such steels as SAE, AISI, etc."

Vice-President, Parts Manufacturer—

"... should prove to be the most valuable and essential volume in our Specifications Library. ..."

President, Machine Tool Co.—

"We have had considerable difficulty obtaining the correlation between industrial specifications and army code specifications. Cross index will be of tremendous help."

Engineering Firm—

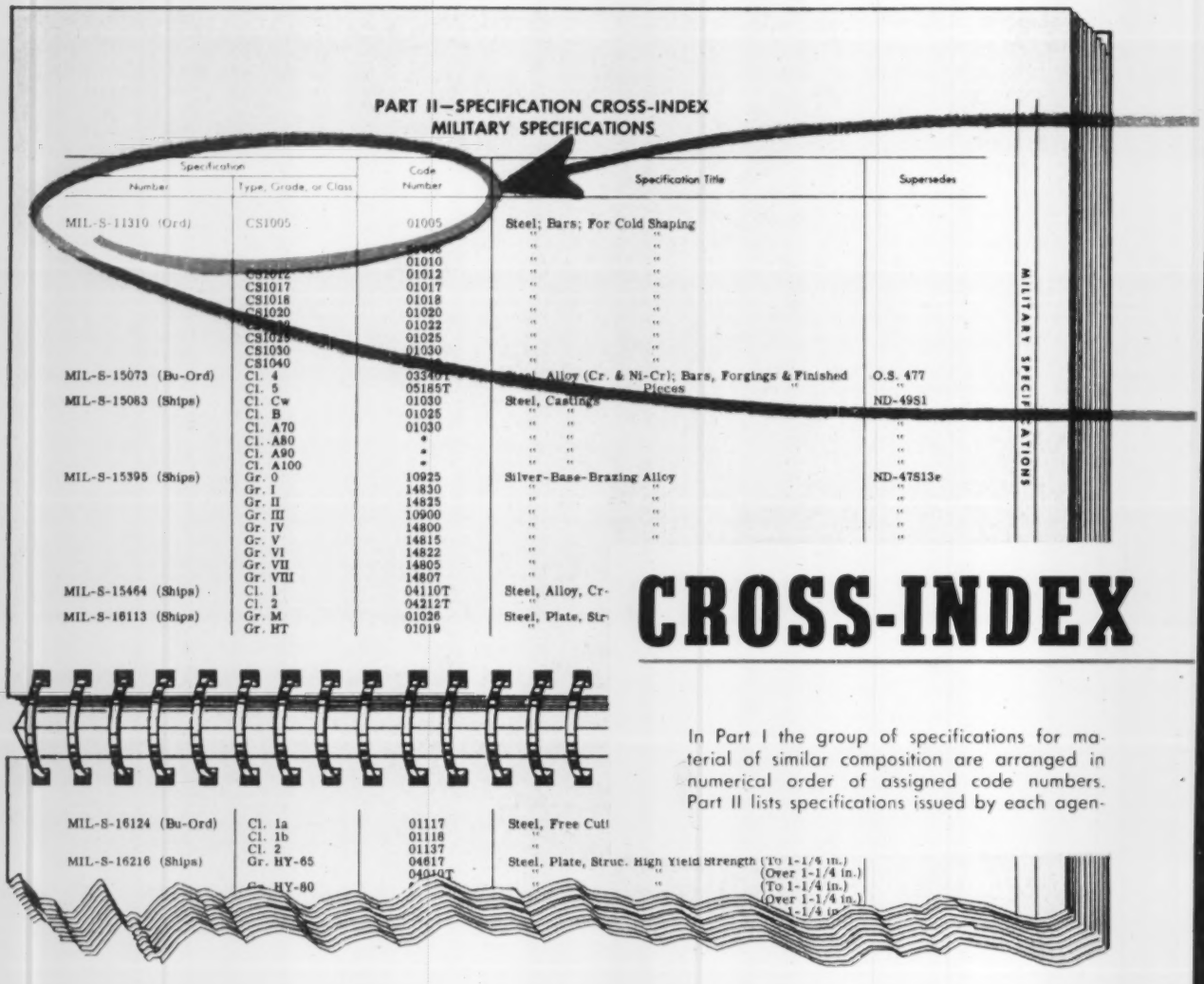
"We have three foundries as clients and have been searching for such an outstanding reference guide that is of great importance in our materials reference problems. We are doing substantial Government work and your booklet is the best solution to this Specification Coding."

Manager, Steel Warehouse—

"We receive numerous calls over our city desk, inquiring about Government Specifications. We find there are a number of new specifications of which we have no record ..."

Vice-President, New England Manufacturer—

"We are urgently in need of your publication cross-indexing chemically equivalent specifications and identifying ferrous and nonferrous alloy codes. We are sure this would facilitate our order department in checking various Army and Navy Specifications for steel."



PART II—SPECIFICATION CROSS-INDEX
MILITARY SPECIFICATIONS

Specification Number	Type, Grade, or Class	Code Number	Specification Title	Supersedes
MIL-S-11310 (Ord)	CS1005	01005	Steel; Bars; For Cold Shaping	
		[illegible]	" "	
		01010	" "	
	CS1012	01012	" "	
	CS1017	01017	" "	
	CS1018	01018	" "	
	CS1020	01020	" "	
	CS1022	01022	" "	
	CS1025	01025	" "	
	CS1030	01030	" "	
	CS1040	[illegible]	" "	
MIL-S-15073 (Bu-Ord)	Cl. 4	03340T	[illegible] Alloy (Cr. & Ni-Cr); Bars, Forgings & Finished Pieces	O.S. 477
	Cl. 5	05185T	" " "	"
MIL-S-15083 (Ships)	Cl. Cw	01030	Steel, Castings	ND-49S1
	Cl. B	01025	" "	"
	Cl. A70	01030	" "	"
	Cl. A80	*	" "	"
	Cl. A90	*	" "	"
	Cl. A100	*	" "	"
MIL-S-15395 (Ships)	Gr. 0	10925	Silver-Base-Brazing Alloy	ND-47S13e
	Gr. I	14830	" "	"
	Gr. II	14825	" "	"
	Gr. III	10900	" "	"
	Gr. IV	14800	" "	"
	Gr. V	14815	" "	"
	Gr. VI	14822	" "	"
	Gr. VII	14805	" "	"
	Gr. VIII	14807	" "	"
MIL-S-15464 (Ships)	Cl. 1	04110T	Steel, Alloy, Cr-	
	Cl. 2	04212T	" "	
MIL-S-16113 (Ships)	Gr. M	01026	Steel, Plate, Str-	
	Gr. HT	01019	" "	
MIL-S-16124 (Bu-Ord)	Cl. 1a	01117	Steel, Free Cut	
	Cl. 1b	01118	" "	
	Cl. 2	01137	" "	
MIL-S-16216 (Ships)	Gr. HY-65	04617	Steel, Plate, Struc. High Yield Strength (To 1-1/4 in.)	
		04010T	" " (Over 1-1/4 in.)	
	Gr. HY-80	[illegible]	" " (To 1-1/4 in.)	
			" " (Over 1-1/4 in.)	
			" " 1-1/4 in.	

MILITARY SPECIFICATIONS

CROSS-INDEX

In Part I the group of specifications for material of similar composition are arranged in numerical order of assigned code numbers. Part II lists specifications issued by each agen-

the title of the material; and 3. a serial number determined by the alphabetical location of the title. The groups included in the Cross Index are "QQ" and "WW".

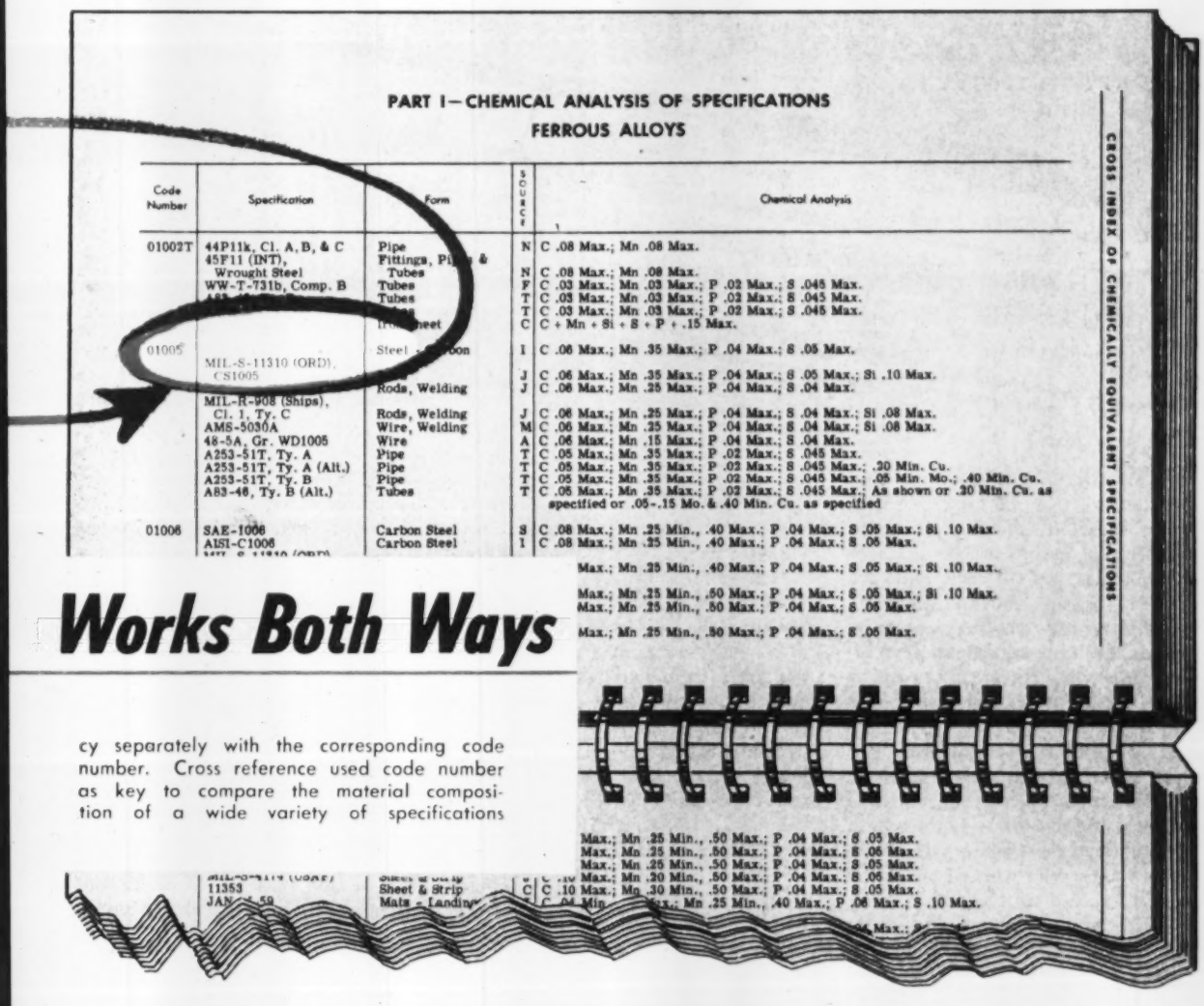
Specifications listed in the U. S. Army specifications section are those which have been issued by the technical services of the Department of the Army. U. S. Air Force specifications are also included in the Cross Index.

Specifications of the U. S. Navy given in the Cross Index consist of the regular Navy Department specifications and various interim specifications of the several bureaus of the Navy Department.

Army-Navy Aeronautical series of specifications are issued by the Aeronautical Standards Group. There were two types of numbers for ANA specifications. The first based on the Federal Catalog is no longer being assigned. The second is similar to the first, but simplified. Examples: AN-WW-T-833, AN-T-33. Revised specifications supersede previous issues of the specifications together with all amendments. Such revisions are indicated by a letter suffix to the original number. Thus, AN-G-2b, where "b" indicates the second revision.

Military specifications section includes those which have been issued by the Munitions Board Standards Agency and are composed of Military specifications (MIL) and Joint Army-Navy specifications (JAN).

Non-Military Too — The standards of the American Society for Testing Materials given in the Cross Index are those of the ferrous and nonferrous groups. The specification designation of the ASTM regular standards is composed of three parts: 1. A letter indicating the general classification—"A" denotes ferrous material and "B" nonferrous material, 2. A serial number, which like the letter is permanent, 3. The number following the dash indicates the year of adoption or year of last revision.


PART I—CHEMICAL ANALYSIS OF SPECIFICATIONS
FERROUS ALLOYS
CROSS INDEX OF CHEMICALLY EQUIVALENT SPECIFICATIONS
Code Number
Specification
Form
Source
Chemical Analysis
01002T
44P11k, Cl. A, B, & C
45F11 (INT), Wrought Steel
WW-T-731b, Comp. B
Pipe
Fittings, Pipe, & Tubes
Tubes
Tubes
Sheet
C .08 Max.; Mn .08 Max.
C .08 Max.; Mn .08 Max.
C .03 Max.; Mn .03 Max.; P .02 Max.; S .045 Max.
C .03 Max.; Mn .03 Max.; P .02 Max.; S .045 Max.
C .03 Max.; Mn .03 Max.; P .02 Max.; S .045 Max.
C + Mn + Si + S + P + .15 Max.
01005
MIL-S-11310 (ORD), CS1005
Steel
C .06 Max.; Mn .35 Max.; P .04 Max.; S .05 Max.
C .06 Max.; Mn .35 Max.; P .04 Max.; S .05 Max.; Si .10 Max.
MIL-R-908 (Ships), Cl. 1, Ty. C
Rods, Welding
C .06 Max.; Mn .25 Max.; P .04 Max.; S .04 Max.
C .06 Max.; Mn .25 Max.; P .04 Max.; S .04 Max.; Si .08 Max.
AMS-5030A
Wire, Welding
C .06 Max.; Mn .25 Max.; P .04 Max.; S .04 Max.; Si .08 Max.
48-5A, Gr. WD1005
Wire
C .06 Max.; Mn .15 Max.; P .04 Max.; S .04 Max.
A253-51T, Ty. A
Pipe
C .05 Max.; Mn .35 Max.; P .02 Max.; S .045 Max.
A253-51T, Ty. A (Alt.)
Pipe
C .05 Max.; Mn .35 Max.; P .02 Max.; S .045 Max.; .20 Min. Cu.
A253-51T, Ty. B
Pipe
C .05 Max.; Mn .35 Max.; P .02 Max.; S .045 Max.; .05 Min. Mo.; .40 Min. Cu.
A83-46, Ty. B (Alt.)
Tubes
C .06 Max.; Mn .35 Max.; P .02 Max.; S .045 Max.; As shown or .20 Min. Cu. as specified or .05-.15 Mo. & .40 Min. Cu. as specified
01006
SAE-1006
AISI-C1006
Carbon Steel
Carbon Steel
S
I
C .08 Max.; Mn .25 Min., .40 Max.; P .04 Max.; S .05 Max.; Si .10 Max.
C .08 Max.; Mn .25 Min., .40 Max.; P .04 Max.; S .06 Max.
Works Both Ways
cy separately with the corresponding code number. Cross reference used code number as key to compare the material composition of a wide variety of specifications
11353
Sheet & Strip
Mats - Landing
C
C .10 Max.; Mn .30 Min., .50 Max.; P .04 Max.; S .05 Max.
Mn .25 Min., .40 Max.; P .06 Max.; S .10 Max.

Thus, A155-51 is the specification number for "Electric fusion-welded steel pipe for high temperature and high pressure service" and was adopted as a standard in 1951.

Aeronautical Materials specifications (AMS) given in the Cross Index are those issued by the Aeronautics Divison of the Society of Automotive Engineers (SAE) Standards Committee. They are complete procurement specifications for materials used in the manufacture of aircraft.

Co-ordinated — Chemical and physical composition of the materials covered by AMS specifications are co-ordinated so far as possible with SAE general standards for similar materials, but where necessary the limits of acceptable composition may be more restrictive. In such cases, effort is made to keep these limits within the limits of basic SAE standard compositions, such as SAE steels. The symbol "AMS" preceding the aeronautical material specification number is an integral part of the identification and is always included in referring to individual specifications by number. Revised or amended specifications are indicated by letter suffixes. Thus, AMS-4145B is the second revision of AMS-4145.

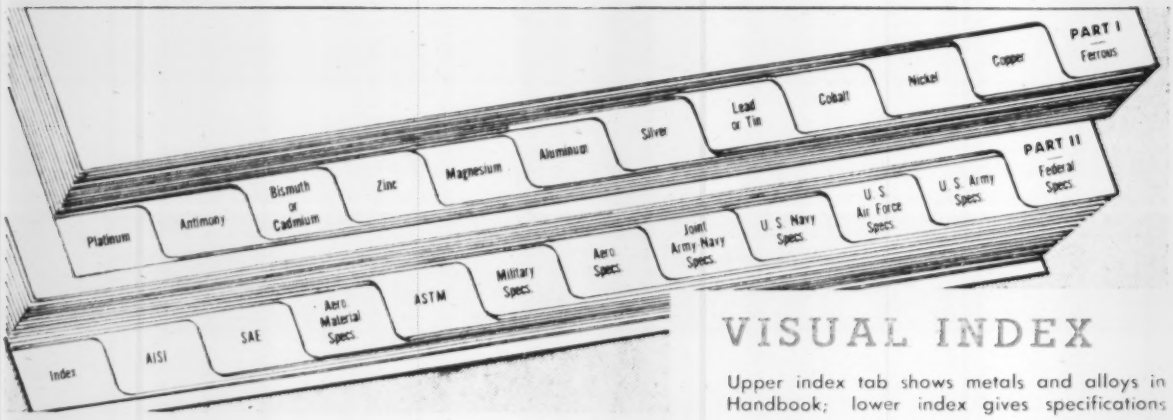
Ferrous and nonferrous standards of the Society of Automotive Engineers (SAE) are included in the Cross Index. These standards in themselves are not complete procurement specifications as are the AMS standards. In general, the SAE standards cover basic industrial materials. In some cases certain physical requirements are a part of the standards in addition to the chemical composition.

Standards of the AISI given in the Cross Index are based on publications of the American Iron & Steel Institute. The AISI steel numbering system is essentially the same as that of the SAE.

Rounded Off — Work on the Cross Index also included a compilation of nominal compositions of materials by code number groups. These nominal compositions are those required by specifications in the extensive first section of the Cross Index. They are generally the arithmetical mean of the element ranges as specified in the detail specification.

STEEL's Specification Handbook is based on detailed chemical compositions as given in the first section of the Cross Index Code and does not include nominal compositions.

Code numbers used in the Cross Index may be used in the prepara-



VISUAL INDEX

Upper index tab shows metals and alloys in Handbook; lower index gives specifications

tion of bills of materials, for submission to the military services, when directed by the procuring service. The assigned code numbers are not intended for and cannot be used in lieu of the specifications themselves for procurement purposes, nor as a specification number. Also, the fact that two or more specifications are represented in the Cross Index by the same code number is no assurance that such specifications cover materials of identical physical properties.

Cross Index Story—Let's take a look now at the human side of the cross index, who worked on it and how it evolved to its present state.

Capt. John Locke of the Army Air Force at Dayton, O., first suggested a uniform code to be used which would identify specifications of similar chemical analysis. Several of the larger manufacturers readily agreed to the need for such a plan. Accordingly, a meeting was held in Washington at the request of Col. W. J. Rusch of the statistical section of the War Department.

Representatives of Ford, Chrysler, Nash, General Motors, SAE, AISI and AMA Automotive Council for War Production, first met with representatives of the various Army and Navy Services in Washington on June 16, 1942, to discuss the development of a uniform material specification code.

Five Digit Code—It was agreed by those present that a five digit code would be used. The question of who would work up the code and publish the data then arose. Colonel Rusch proposed that inasmuch as Captain Locke was being transferred to another assignment the work should be done by the industry representatives who were already familiar with the program, and that their proposals be reviewed by the trade associations.

General Motors evolved a plan for tabulating the code using punched card equipment which enabled production of the Cross Index code in much less time than had been discussed at the meeting. R. L. McWilliams and L. A. Walsh of General Motors guided the program. B. J. Kelly, who is now engineer in charge of technical data section at General Motors Technical Center, also worked on the project.

Here's How—A standard worksheet form was drawn up and the following information posted to it: 1. Specification number, 2. source of number, that is, whether number was an Army, SAE, ASTM, Navy, etc. specification, 3. actual chemical analysis of the alloy as specified by the above number and 4. a single spaced code to indicate which elements were specified by that number, without regard to the various percentages.

This information was then transferred to a tabulating card, one card for each specification symbol or number. This made possible the quick grouping together of similar alloys irrespective of their number. The first step in the process was sorting electrically on the element code number.

The next operation sorted these decks electrically according to the percentage of the elements present and grouped them into decks of the same percentage composition. A tabulation of these cards was then printed, automatically reproducing the complete story of each specification as it appeared on the original worksheet, but sorted into group of chemically equivalent specifications. This information was then arranged in cross reference form for ready use.

Bigger and Better—Hundreds of letters sent in by users of the first two versions of the Cross Index attested to useful purpose it served. However, a need was felt for a revised and enlarged cross-index.

On Dec. 27, 1951 a conference was held by the Standards Agency of the Munitions Board to develop plans for a new Cross Index. Chairman of this meeting was B. Rosenzweig, Munitions Board Standards Agency, of which Russel A. Moody is director.

The outcome: R. L. McWilliams of General Motors Corp., spearheaded the development of a new Cross Index in co-operation with a joint Army-Navy-Air Force group. Working closely with GM were Maj. W. S. Ferguson and D. B. Sullivan, Production Resources Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton.

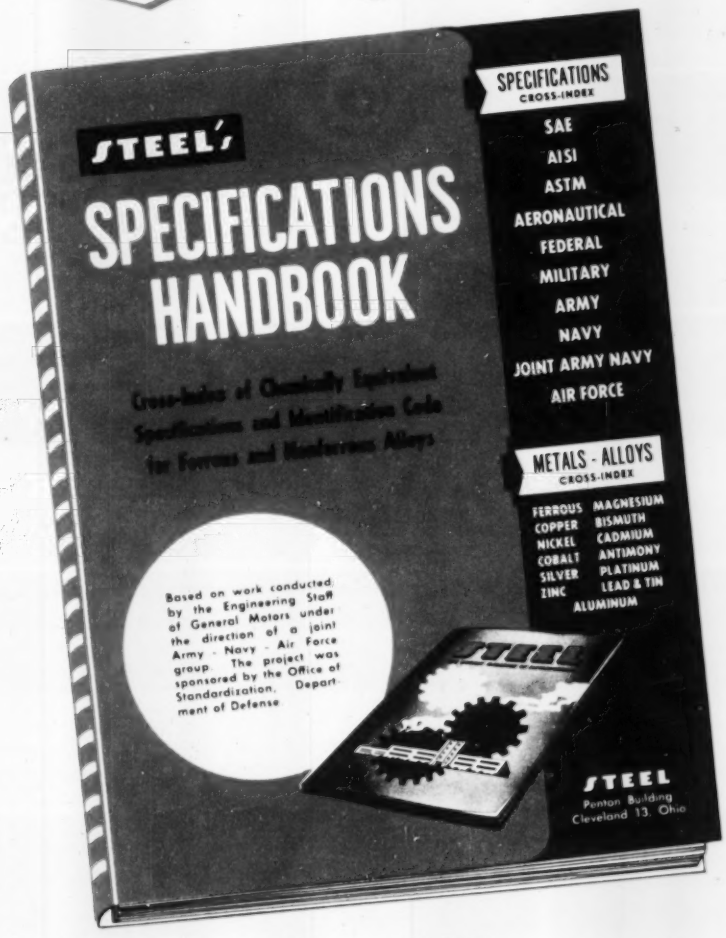
TABLE II
SPECIFICATIONS INCLUDED IN THE CROSS INDEX

A: United States
B: Aeronautical Standards Group
C: United States Air Force
F: Federal
I: American Iron & Steel Institute
J: MIL and JAN Specifications
M: Aeronautical Materials Standards (SAE)
N: U. S. Navy
S: Society of Automotive Engineers
T: American Society for Testing Materials

380 PAGES

SIZE 6" x 8½"

VISUAL INDEX



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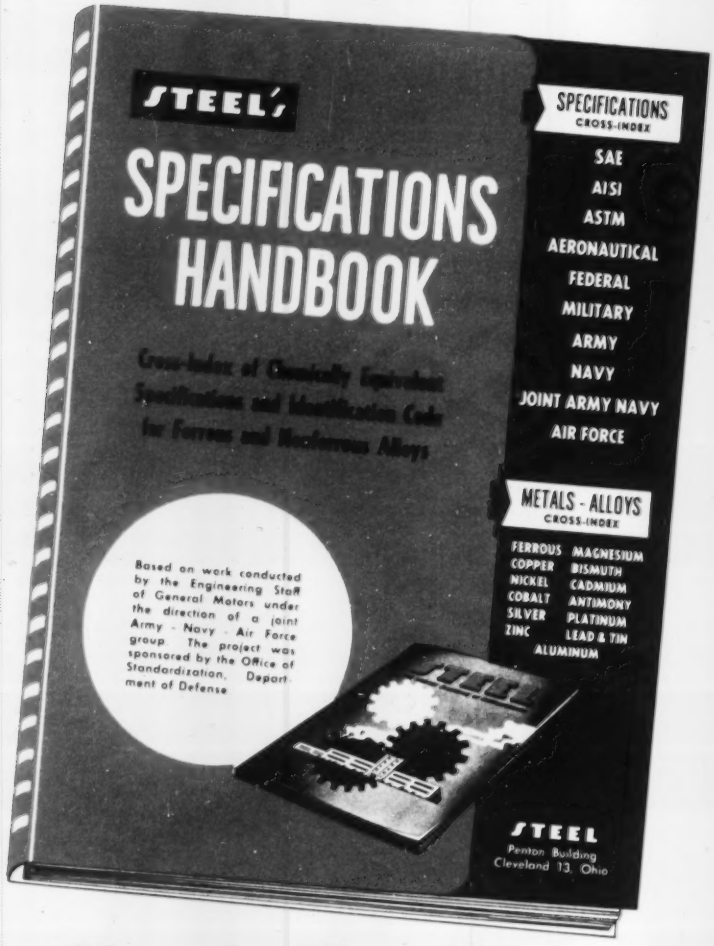

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Eastern Steelmaker Reduces Masonry Man-Hours

Suspended rammed or castable refractories substituted for sprung arch or suspended brick construction on open hearths increase production and extend life

By R. RUSSELL FAYLES
Superintendent Refractories and Fuel
Lukens Steel Co.
Coatesville, Pa.

RAPID growth in the use of rammed and castable materials for steel plant service marks a present trend in the refractory field. These materials possess high-temperature capabilities, adequate strength and good expansion characteristics.

A review of practices with these products at the plant of the Lukens Steel Co., Coatesville, Pa., probably will establish a pattern similar to that of other companies, varying only in degree or intensity. Here the first use of plastics came in the late 30's with the adoption of plastic chrome ore for open-hearth door linings. The old, conventional clay brick door lining with its 10-heat life was converted to the studded, rammed, and steam-dried plastic chrome ore lining which now gives upwards of 110 heats per lining. Experiments with various door lining methods and materials have been many and varied but, up to the present, plastic chrome ore has rendered the superior service. Chrome castables for this service are now undergoing trial but factual data are insufficient to establish any conclusions.

Speeds Bottom-Making — Rammable materials for bottom construction also began in the late 30's and included both plastic chrome ore and magnesia materials for subhearth areas. Lukens has used both types of refractories for such service on all new open-hearth bottoms installed since 1940. Gradually, the application of this general type of material has been extended, until now high magnesia, rammed refractories are used for extensive areas of the hearth. Gone are the days of lengthy bottom sintering when magnesite was the preferred bottom material. Valuable time has been saved and additional steel produced by rapid bottom-making with rammed hearth materials. The large number of rammed open-hearth bottoms already installed or contemplated is indisputable evidence of the acceptance of rammed refractories for this important furnace service.

Miscellaneous uses for rammed or castable refractories in open-hearth service constitute an interesting although not too important item. Because of varying shop factors, such uses are generally spotty and cannot be copied except with caution. Some that come to mind are special linings for tapping spouts, facings for bridgewalls, burner port coverings, and others. Gun-emplaced refractories used for various points of furnace maintenance have also enjoyed varying degrees of success, depending on shop conditions. Theoretically, such an operation offers definite value to any plant. However, a combination of indifferent refractory performance, charging floor nuisance, and furnace downtime have limited its use. Lukens is employing the refractory gun for spot repairs to prolong furnace life or postpone repairs and also to spray regenerator roofs to reduce air infiltration. Gunned refractories of our own making are being used in an effort to improve both the shooting operation and the performance of the refractory.

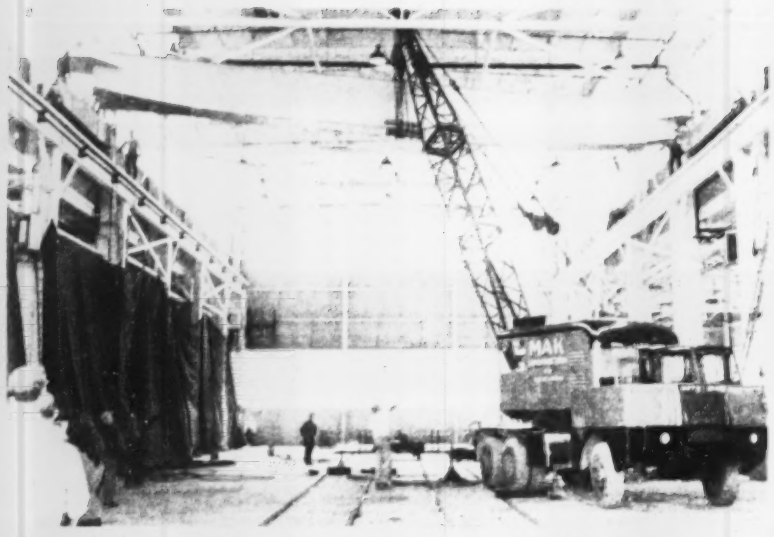
Undergoes Transition—Most of the foregoing is a prelude to the major campaign now in effect. Systematically throughout the entire plant, sprung arch or suspended brick constructions are being eliminated in favor of suspended rammed or castable refractories wherever possible. In addition, probing is being done into the possibilities of substituting these materials for soaking pit walls and other areas involving firebrick construction. This plan has been motivated by a single purpose, namely, to reduce masonry man-hour requirements to the lowest possible level.

Because the plant is bound down by a bricklayer shortage and an inability to attract apprentices, plans have been directed along the lines that our masonry crews can utilize nearly all their efforts toward rebuilding open-hearth furnaces. In conjunction with this plan, the thesis was developed that unskilled labor can satisfactorily install these special refractories.

At present, 24 soaking pit covers, four ingot heating furnace roofs, seven reheating or heat treating furnace roofs and three open-hearth furnace fantail roofs are constructed of rammed or castable refractories. Plans specify that all new miscellaneous heating furnaces must have plastic or castable roofs for the original installations. Slowly but surely we are proceeding to the point where almost all our masonry hours can be devoted to open-hearth work and appreciably speed up furnace rebuild time.

The entire program has proved the new suspensions outlast the old types from two to five times and so reduce maintenance costs and outage times as to show a tidy cost saving in every case. Thus, the whole procedure is pleasing top management costwise, our operating supervision by reducing delays, and the refractory department by easing our bricklayer shortage to a marked degree.

Trial Yields Results — Open-hearth rammed fantail roof construction was of secondary interest when the program was inaugurated, but success in other parts of the plant prompted a calculated risk trial on a single open-hearth furnace. This initial installation was made on a 135-ton furnace originally built for 75 tons and



New Building Readied for Press Brake Work

One crane helps build another in this new building at Cleveland Crane & Engineering Co., Wickliffe, O. Shown above is a 25-ton Lorain Moto-Crane placing a 12-ton overhead crane girder on its tramrails 35 feet above the floor. The overhead crane will be used to handle press brakes built by the Wickliffe firm

having two regenerator chambers at each end (producer gas fired originally; now oil fired). The division wall between the chambers extended to the slag pocket area and created rather restricted, crooked fantail openings into the checker areas. The roofs were entirely of sprung arch construction, using semisilica brick throughout. The fantail roof zones were prone to air leakage and had rather high maintenance costs. Extensive repair or complete replacement were usually necessary within 500 heats and embarrassing furnace shutdowns were sometimes required when the arch in the sidewall at the juncture of the wall and fantail collapsed.

Redesign called for the elimination of the central division wall from the slag pocket area to a point 7 feet beyond the checker bridgewall. The entire fantail roof from this point to the "nose" at its junction with the vertical uptake wall and a short distance up the wall was of suspended, plastic firebrick construction. These changes gave an improved gas flow pattern into the checkers and a slight increase in checker volume due to utilization of the volume formerly occupied by the division wall. The monolithic, rammed roof construction provided a design that virtually eliminated air leakage, gave promise of extended service life and simplified repair when and if required.

Ups Production—Effect of these design changes on furnace operation as well as the performance of the rammed refractory was gratifying. On the first redesigned furnace, the production rate increased 11 per cent and the fuel rate decreased 10 per cent with all other factors as nearly constant as routine operation would permit. Spurred by this initial success, the design changes were duplicated on another furnace, which showed an 11 per cent production increase and a 4 per cent fuel decrease. Still another furnace was similarly changed, except it was of a basic end construction with a basic fantail nose and the rammed plastic fantail roofs. This unit only has 100 heats out on the run, but compared with a like period during the previous run shows a 9 per cent production increase with a 4 per cent fuel decrease. The first redesigned furnace now has made 480 heats since the installation of the rammed fantails and has had only a small repair to one roof, occasioned by an overload of dolomite and lime which piled up on the suspended section. These areas are now fully protected and no further trouble contemplated.

Inspections have failed to reveal the slightest wear on the fantail or regenerator roof sections; they give every evidence of lasting indefinitely. There is an appreciable wearing action on the face of the "nose" occasioned by the flow of molten silica brick from the wall above. This sloughing action appears to cut away about 1 inch of the plastic on each roof run of 180 to 200 heats. This erosion only occurs on that portion of the "nose" directly under the uptake wall and, when repairs do become necessary, they will be of a minor nature. All three of these installations came through the recent strike shutdown without the slightest sign of deterioration aside from a couple of shrinkage cracks which have closed completely since the units again went in production.

Performance of the furnaces and refractories has been excellent in every respect. Installation costs have been on a par with or less than an equivalent suspended brick construction and, in every case, have been completely paid for from savings during the first roof campaign. As rapidly as rebuild schedules will permit, all furnaces will be changed to conform to the new design and incorporate rammed refractories in all installations.

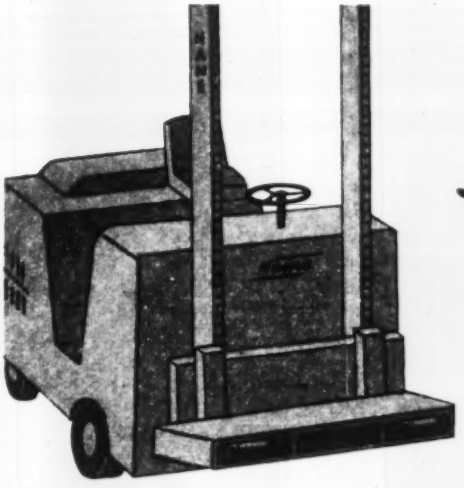
From a paper presented at annual conference, Southern Ohio Section, National Open Hearth Committee of A.I.M.E., Columbus, O., Oct. 3-4, 1952.

Atom School Registration Open

Applications for admission to the 1953-54 session of Oak Ridge School of Reactor Technology must be submitted to the school not later than March 1. Admission is open to recent graduates and to sponsored students from industry and from government agencies. This session begins in September.

Objective of the school is to provide a source of the uniquely-trained technical personnel required for the AEC's reactor development program by training selected university graduates who join various government agencies and atomic energy contractors as regular employees at the end of the training period.

The school also supplements the training of practicing engineers and scientists from industry to enable them to participate, through their sponsoring organizations, in atomic energy development work.



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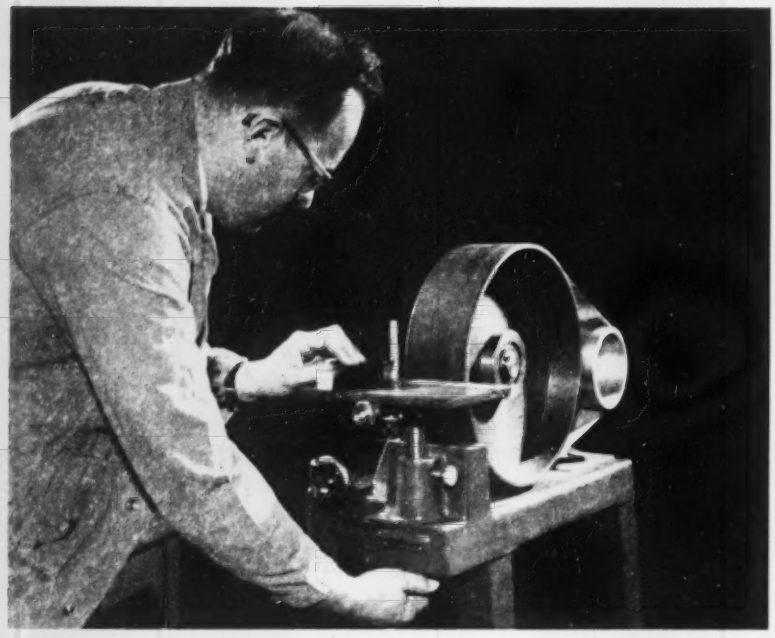


Adjusting work table height for grinding desired relief angle on carbide tool. Table is raised until point of tool reaches desired angle marking

Belt Grinding Sharpens Carbide Tools

Method is reported to cut costs of tool sharpening, extend tool life and ease diamond wheel shortage. Could also make carbide tool use economical for many small shops

SHARPENING tungsten-carbide cutting tools by a method that does not use a diamond wheel, costs approximately two-thirds less per tool sharpened than the diamond-wheel method, and produces a longer lasting cutting edge on the tool is now a reality. A result of co-operative engineering between Behr-Manning Corp., Troy, N. Y., and Fenlind Engineering Co., Rockford, Ill., the machine uses as a grinding element a coated abrasive belt that travels over a cast iron contact wheel specially formulated for extreme hardness.

Of immediate importance to the metalworking industry, the new development removes the urgent need for diamond grinding wheels now in critically short supply. And because of its lower operating costs and the better cutting edges produced, it makes tungsten carbide tipped cutting tools available to an estimated 60,000 small shops which cannot afford the diamond wheels previously necessary for sharpening purposes.

Cuts Time, Too—Field tests by Behr-Manning engineers show that belt costs for sharpening tungsten-carbide tool bits range between one and three cents per tool. In addition to this two-third reduction in cost of materials, the abrasive belt procedure eliminates two traditional steps without sacrificing cutting tool performance.

With the new method, the intermediate grind and the finish-honing operations are no longer necessary. After the clearance angle has been rough-ground on the tool with a silicon carbide wheel, the relief angle and final cutting surface can be micro-finished in one operation with the coated abrasive belt.

Double The Life—Working life of tungsten-carbide tipped cutting tools sharpened by a coated abrasive belt averages about double the life of those sharpened by conventional methods. In one controlled test made on a production line turning 5665 nickel alloy, the carbide turning tools sharpened by diamond wheels averaged 12 pieces per resharpened tool.

In contrast, those sharpened by a coated abrasive belt completed an average of 31 pieces before resharpening was required. In another shop where parts made of AMS 5060 steel were being machined, diamond wheel sharpened carbide tools produced 120 pieces but the belt-ground tools turned out an average of 202-1/3 pieces per resharpened tool.

Better Finish, Longer Life—The finer finish produced by the abrasive belt on the cutting face of the carbide tip accounts for the extended tool life. A finish of 2-16 micro-inches rms is put on the tool by the 220-grit belt. In addition to the better finish it produces, the belt method does not produce chipping on the cutting edge of the tool that must be honed off with a diamond hone when carbide tipped tools are sharpened by conventional methods.

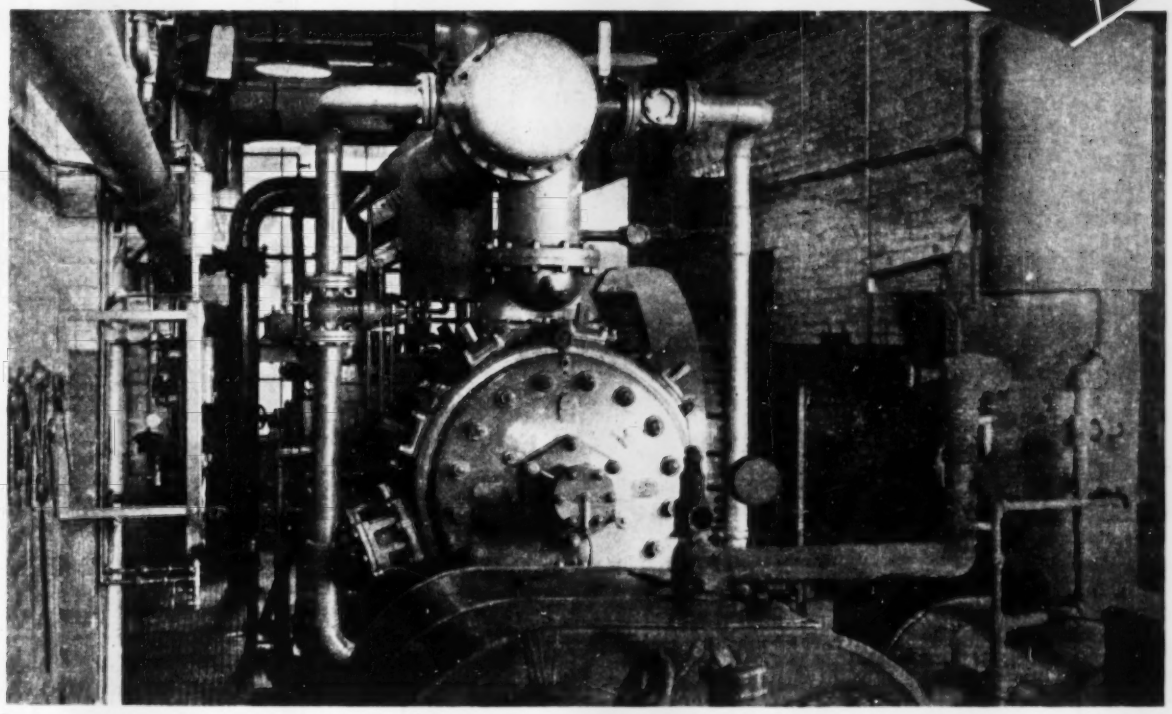
The machine that makes possible this method of sharpening carbide tipped tools is called the Fenlind Micro-Finisher. Waterproof silicon carbide paper belt (Speed-wet durite) is driven by a 14-inch cast iron contact wheel. The height of the work table can be adjusted in relation to the contact wheel to permit any normal relief angle to be micro-finished on the carbide cutting tool.

Unique Method—The method of setting the relief angle on the cutting tool with this machine is new to the tool grinders' trade, and reflects simple but ingenious design. The relief angle is set by adjusting the height of the table until the face of the cutting tool contacts the belt on the periphery of the contact wheel at a point on its curvature that corresponds to the relief angle desired.

A vertical gage, marked in degrees from one to 22, is accurately mounted near the table at the left of the wheel. Proper table height is established for a desired relief angle by aligning the cutting edge of the carbide tip with the correct angle marking on the vertical gage.

Takes Two Steps—The procedure for sharpening carbide tipped

Is available floor space holding back expansion of your plant air facilities?



Haven't got the floor space for additional plant air facilities? Don't be too sure!

How about the nooks and crannies, or right in among your machine tools? Other plants are squeezing Clark Balanced/Opposed Compressors in many such "impossible" places. The above illustration, in an aluminum forging plant, is a typical example. Here a 600 hp, 3200 cfm Clark unit was squeezed into a 20 x 13 ft. floor area.

It's a fact that a Clark Balanced/Opposed Compressor can be moved in anywhere. One of the reasons is its compactness. Another is its absolutely vibration-free performance. You can set it in a corner, on a second floor, or alongside even the most delicate of machining operations. The savings in building, piping and installation costs are considerable.

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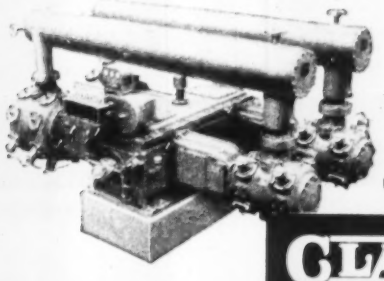

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CLARK balanced/opposed compressors

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tools with the belt method involves two steps: First, rough grind the clearance angle with a silicon carbide grinding wheel. Second, with the belt machine table set to produce the correct relief angle, micro-finish both front and side relief angles of the tungsten-carbide tool, and micro-finish the nose angle by swinging the tool through approximately a 90-degree arc.

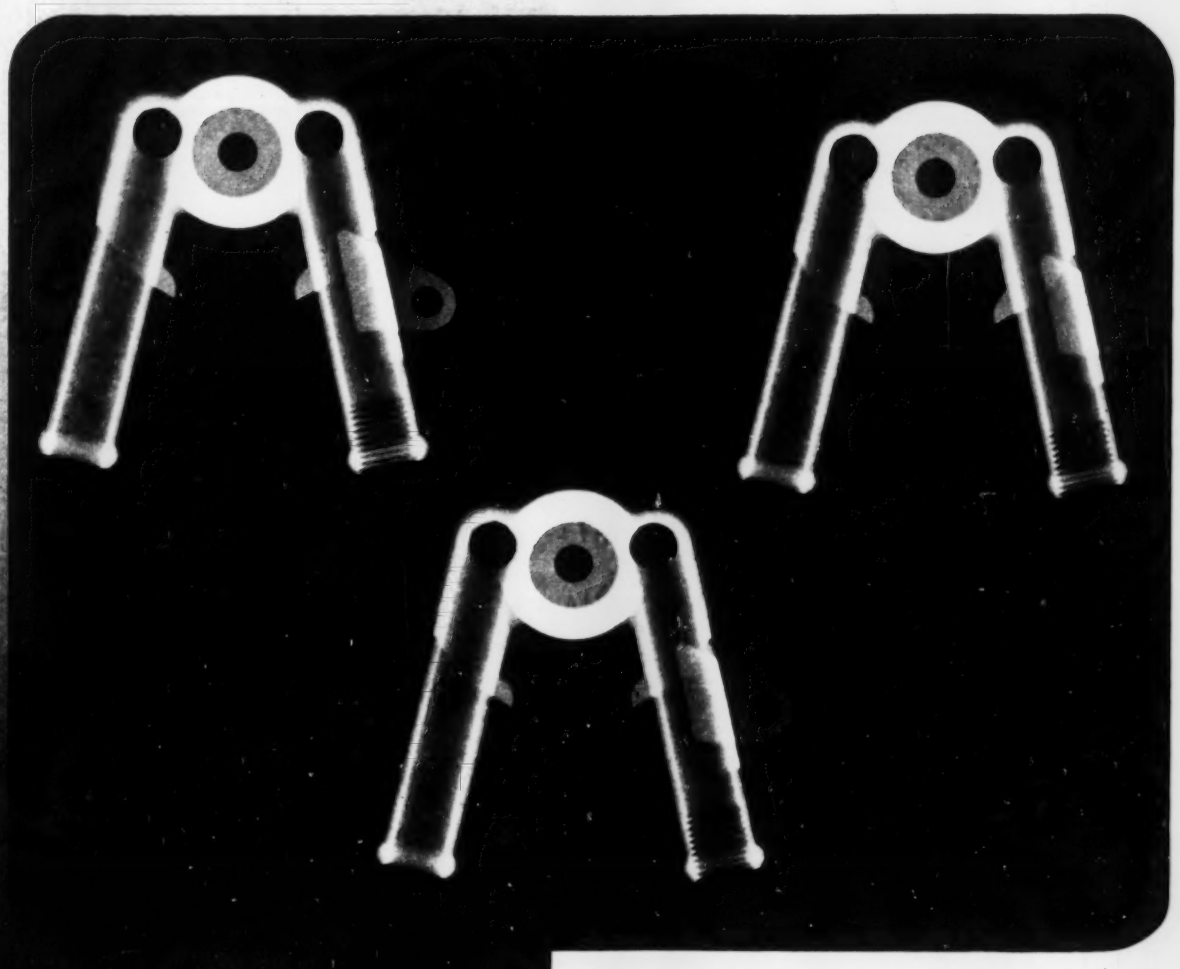
Light manual pressure is adequate to produce a fine finish and no edge of the cutting tool need be held against the belt for more than two or three seconds.

Wire Container Patent Eased

Release of its patented molded magnet wire container to all manufacturers is announced by Anaconda Wire & Cable Co., New York. Wire producers are free to use the container themselves, for shipment of their own magnet wire products.

The new container is intended to replace the wood type. Form-fitting in design, it results in substantial savings in freight charges and warehousing; makes for easier handling because it is lighter, and when empty it stores in one-third the space occupied by a comparable number of wood containers.

Radiograph of automotive heater shut-off valve.



RADIOGRAPHY
Sets the stage for high yield runs

FOR EXAMPLE, take this automotive heater shut-off valve. Radiographs of pilot castings, made prior to production runs, disclosed a few recurring areas of porosity. A minor change in casting technique brought a higher yield of sound castings.

Cases like this show why more and more progressive suppliers of castings are employing radiography. It leads to sound production quickly, lets them know only high-quality work is released.

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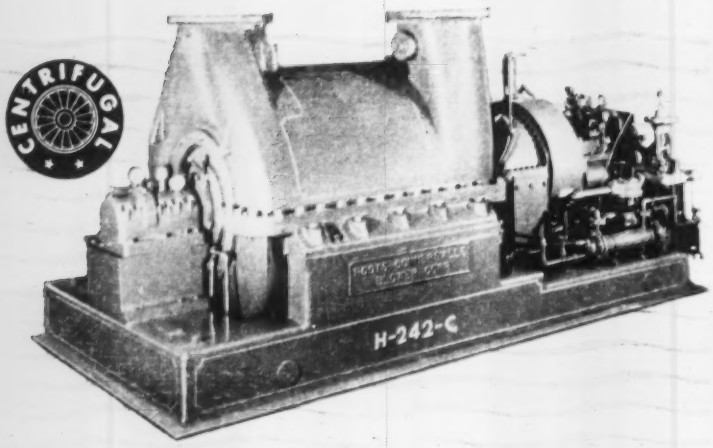

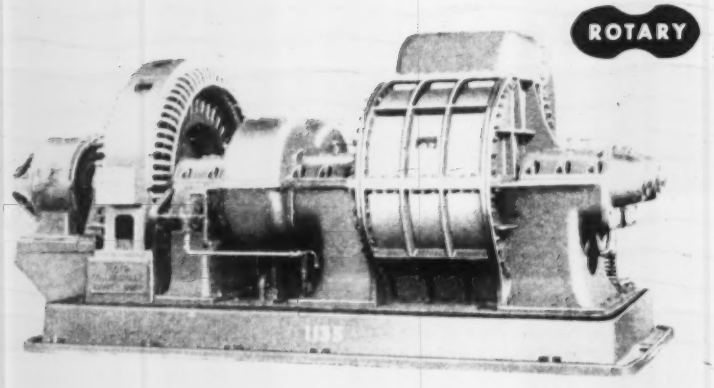

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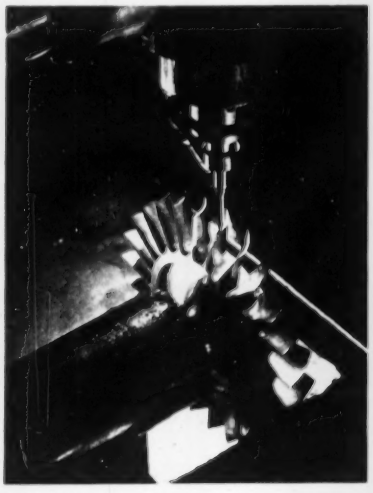
Self-Designed Rotor Mill

MAJOR MACHINING problem involving work on complicated rotor blades for a ramjet engine turbine was solved by its own designers, reports Marquardt Aircraft Co., Van Nuys, Calif. Needed was a milling machine that could produce tolerances required for the rotor blades on a production schedule that matched normal plant engine output.

Rotor blades must be precision cut because they act as a turbine driving the spur-gear train mechanism for the engine's governor, alternator and generator. Another larger set of blades serves as the driving device used for the fuel pump.



SPECIAL HEAD, CAM SERIES
. . . cuts turbine engine blades

All-Angle Head—The Marquardt-designed head employs a complicated series of cams and a Fray all-angle cutting head turning at 1800 rpm. Cutting so far has been done by using end mills and rotary burrs.

The materials used for the rotors are Chromoloy steel and 24ST aluminum.

Rotor blades are cut from a turned blank metal piece. They are machined with sufficient precision that only a burring operation is required to produce necessary finish and tolerance before final installation. Air flow blade surfaces are maintained to about 10 to 20 rms finishes.

Reynolds
ALUMINUM REPORTER

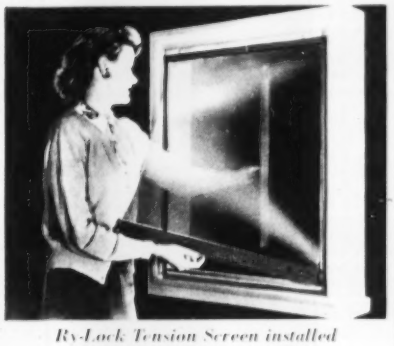
★ ★ ★ Twelfth in a Series to Industry on Aluminum Uses and Developments ★ ★ ★

ALUMINUM EFFICIENT IN FRAMELESS BUILDINGS

Many Important Sales Advantages Displayed in Popular Aluminum Tension Screens

Simple installation, easy operation, long life and comparatively low cost are prime features of the aluminum tension screens made by the Ry-Lock Company Ltd., of San Leandro, California. These builder and owner advantages are heightened by the use of rustproof, rotproof, always attractive aluminum in both screens and screen framing.

Ry-Lock, the first aluminum tension screen manufacturer in the country, uses Reynolds Aluminum exclusively in their quality line of tension screens for wood and metal windows of all types. Clingan and Fortier, Inc., one of the Reynolds Distributors in Los Angeles and San Francisco, serves the Ry-Lock Company with aluminum for screen bars and hardware fittings.



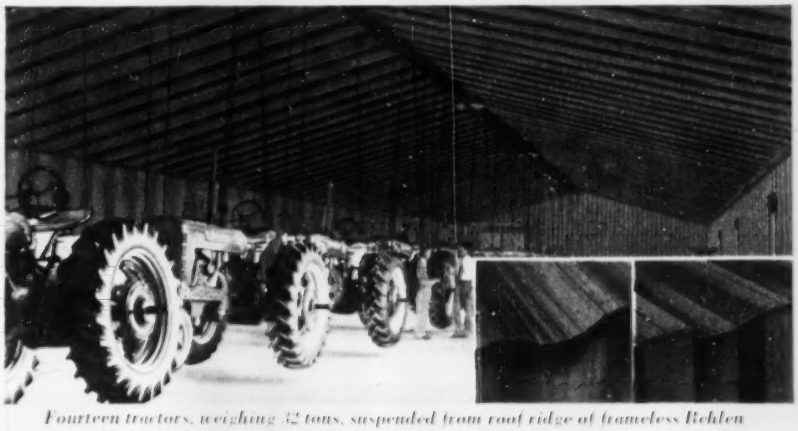
Ry-Lock Tension Screen installed on casement window.

The aluminum construction gives Ry-Lock sales advantages not provided by other materials. There is nothing to rot or warp. Aluminum does not require painting yet blends with any color scheme. Furthermore, users can be assured that surfaces adjoining the aluminum screens will not be streaked with rust or corrosion stains.

Tension screens manufactured and distributed under the "Ry-Lock" name in the eleven Western states are a product of the Ry-Lock Company. The New York Wire Cloth Company has been licensed to manufacture and distribute them in the other thirty-seven states under the name "Durall."

For a free copy of Reynolds 1953 Product Design catalog, and a complete index of technical literature and movies, write to Reynolds Metals Company, 2556 South Third Street, Louisville 1, Kentucky.

Behlen Manufacturing Company Opens Broad New Fields In Modern Building Design and Construction



Fourteen tractors, weighing 32 tons, suspended from roof ridge of frameless Behlen aluminum building. Insets show alternate methods of eave construction.

Ample proof of what you can accomplish with aluminum and good design, is found in the popular frameless aluminum buildings produced by the Behlen Manufacturing Company of Columbus, Nebraska.

Designed primarily for industrial, farm and military use, these straight-side, frameless Behlen buildings are constructed without upright support members for walls or in the interior, and without truss support for the gable-type roof.

Deeply corrugated aluminum panels for walls and roofs are bolted together at the eaves and roof ridge to form a continuous arch. The arch sections are in turn bolted to each other to form a complete, weatherproof, load-bearing shell.

Panels for the Behlen buildings are made from .061-inch to .072-inch aluminum alloy sheets, corrugated to a depth of $7\frac{1}{2}$ inches. This corrugating adds so much rigidity that each arch section has the same strength as an I beam of equivalent weight.

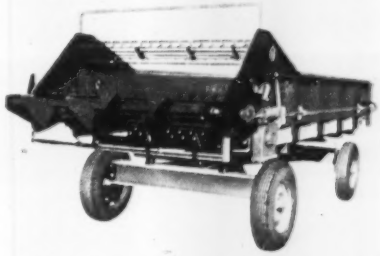
All of the important advantages of strong, light weight, rust-proof, heat reflecting, maintenance-free aluminum are utilized to the maximum by progressive Behlen engineers. To get similar advantages in your products, have a Reynolds Aluminum Specialist assist you on new or redesign problems.

Reynolds Aluminum Specialists will be glad to work with you, just as they have worked with Behlen and countless other companies. This assistance is yours without obligation through the Reynolds office or Reynolds Distributor listed under "Aluminum" in your classified telephone directory. Or write direct to Reynolds Metals Company, 2556 South Third Street, Louisville 1, Kentucky.

Rustproof, Acid Resistant Aluminum Plays Important Role in Manure Spreader

In this efficient combination of power box and manure spreader, the rustproof and corrosion resistant advantages of aluminum are used to withstand manure acids.

The Farmhand Power-Box sits on truck, wagon or trailer with equal ease. When connected to a source of power, the bed of the



box moves the load back to a Farmhand Spreader Attachment for the final flip that distributes manure evenly over the field.

Because of the corrosive action of manure, both pieces of equipment are made primarily of aluminum and treated wood. They are manufactured by The Farmhand Company, a division of Superior Separator Company, Hopkins, Minnesota.

MORE INTERESTING NEWS ABOUT ALUMINUM ON NEXT PAGE

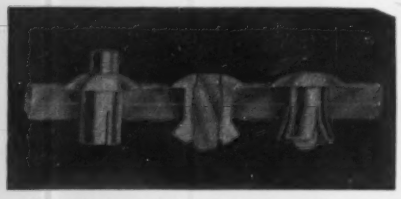
(Advertisement)

Printed in U.S.A.

(Continued From Preceding Page)

Aluminum Drive Rivets Save Production Time and Money

Aluminum rivets, nuts, bolts, screw, washer, cotter-pins and other mechanical fasteners are produced by a number of leading manufacturers who rely on Reynolds for top quality material. A typical example, is the aluminum Southco Drive Rivet, one of several aluminum fastening devices made by the South Chester Corporation of Lester, Pennsylvania.



The photograph illustrates how a hammer-driven pin expands the prongs of this patented rivet, drawing panels together in a tight, secure joint. Thus blind joints made with aluminum Southco Drive Rivets are quickly and easily completed. There's no backing, trimming or grinding. Once driven, the inserted grooved pin cannot work loose even under severe vibration.

Use of rustproof and corrosion-resistant aluminum fasteners with aluminum assemblies prevents any possibility of galvanic reaction between dissimilar metals when they may be subjected to moisture or water.

For your free copy of the valuable handbook "Fastening Methods for Aluminum," plus a complete index of Reynolds technical literature, write on your business letterhead (otherwise the book is $1.00) to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

Return Flight As Guaranteed

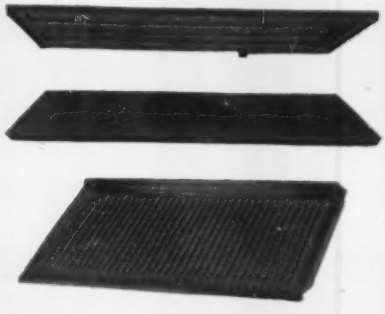
Reynolds Aluminum Foil Now Used As Facing for Glass Fiber Insulation

Gustin-Bacon Manufacturing Company, makers of Ultralite and Ultrafine glass fiber insulations, now offers this material faced with Reynolds Aluminum foil . . . another example of the fast growing list of applications for aluminum foil in many industries.

Growing Industries Rely on Reynolds Aluminum Fabricating Service

More and more companies in diversified industries are taking advantage of Reynolds complete fabricating service for aluminum parts. As an example, illustrated below are two types of aluminum shelving produced by Reynolds Parts Division for the refrigeration industry.

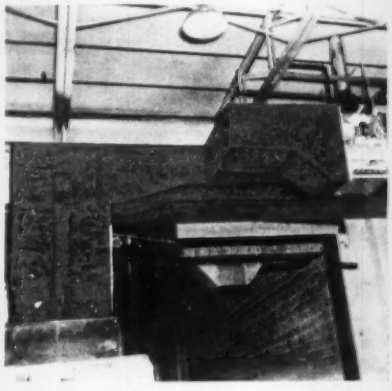
Vertical freezer shelves are made from Reynolds high strength aluminum alloy sheet to which aluminum tubing is cleanly and securely brazed. These shelves provide a high degree of heat transfer efficiency in addition to being rigid and durable. They are available with a plain anodized or Alodized finish. One-



piece, Reynolds Aluminum refrigerator shelving, with a corrosion-proof and chip-proof plain or color anodized finish, is also rigid and attractive.

Whether you want final assemblies, completed parts, blanks or roll-formed shapes, you'll find the extensive facilities and technical assistance of Reynolds Parts Division real value. Contact the nearby Reynolds office listed under "Aluminum" in your classified telephone directory or write Reynolds Metals Company, Parts Division, 2065 South Ninth Street, Louisville 1, Kentucky.

A one-half inch thick pad of the glass fiber with .0007-inch aluminum foil is commonly used as a furnace jacket liner. The radiant heat reflecting surface of the foil, plus the pad of insulation, keeps the jackets cooler and reduces popping noises due to the contraction and expansion of the casing. Leading manufacturers of furnaces are using more and more aluminum foil faced Ultralite and Ultrafine for this purpose.



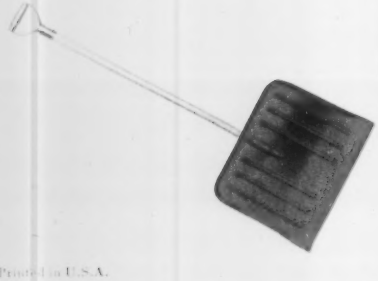
Air conditioning ductwork insulated with foil faced Ultralite

Ultralite faced with .0025-inch aluminum foil also provides a complete vapor barrier in the insulating of air conditioning ducts. The aluminum foil barrier prevents condensation from forming on the cold duct surface or in the bulk insulation. And since aluminum, Ultralite and Ultrafine are all fire-resistant, this insulation passes city building codes. The .0025-inch foil faced Ultralite is also used extensively in the insulation of metal buildings.

The Gustin-Bacon Manufacturing Company has its general offices in Kansas City, Missouri, and maintains branch offices and distributors in a number of large cities.

For information on the application of Reynolds Aluminum foil in your products write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

It's Sno' Fun Without A Light, Aluminum Shovel!



Here's tomorrow's weather forecast: SNOW followed by little boys on sleds . . . and big fellows with snow shovels.

You can cut down on those backaches, however, if you have a featherweight aluminum snow shovel like the one illustrated here, that's made by the Hamlin Metals Products Company of Akron, Ohio.

Hamlin, like other manufacturers of quality products, relies on Reynolds Aluminum to add dependability plus sales appeal to their snow shovels. They make the light weight, rust-free blades with a Reynolds hard aluminum alloy.

Remember whether you are designing or manufacturing anything from snow shovels to steam shovels, Reynolds Aluminum Specialists are ready to help you get the most from aluminum. Call your Reynolds office listed under "Aluminum" in your classified telephone directory or write Reynolds Metals Company, 2576 S. Third St., Louisville 1, Ky.

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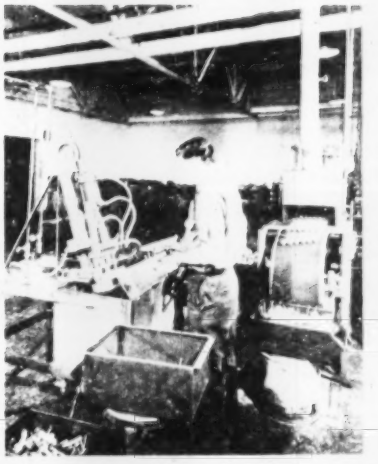
(Advertisement)



Downtime: ½ of 1 per cent

This mesh-belt copper brazing furnace at Acklin Stamping Co., Toledo, O., has been shut down for maintenance only ½ of 1 per cent of total running time, reports the company. The G-E furnace was installed in 1950, and has been operated 16 hours a day, 5 days a week. Total downtime: 40 hrs.

Powder Bearing Standards Set

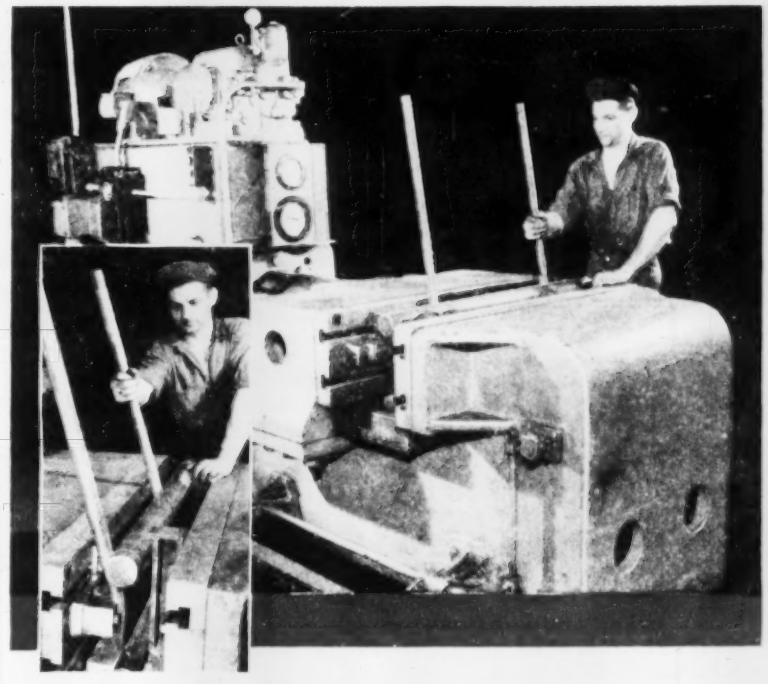
Need for standardization in bearings made from sintered metal powders and impregnated with oil to make them self-lubricating has been met by Metal Powder Association, New York, which has released the first of two new standards.

The new standard is designated 16-52T, "Specifications for Metal Powder Sintered Bearings (Oil Impregnated)," and is identical in substance to ASTM standard B202. By referring to M.P.A. standards, it is now possible for all users of self-lubricating bearings to find complete industry-wide specifications in one place.

Copies of the standards may be obtained at 25 cents per copy from association headquarters in New York.

Flame Cutting Data Published

Principles of flame cutting, procedures and description of the various cutting tools are covered in a 40-page booklet published by National Welding Equipment Co., San Francisco. Designed to help both beginner and experienced operator, copies are available through distributors or the company headquarters.



Mercury Mfg. Co. does a better job twice as fast with a

FARQUHAR Hydraulic Press

Mercury Manufacturing Co., Chicago, Ill., producers of fork trucks, tractors and trailers, uses a 200-Ton Farquhar Horizontal Bulldozer press to make forgings and stampings and to form plates. In operation 8 hours a day, the press does most jobs twice as fast as the mechanical bulldozer used formerly, and better speed control produces better work.

In addition, many pieces of work that used to be farmed out are now done at Mercury providing better production and quality control, and effecting additional savings of time.

In the operation shown above, high carbon brazed steel is bent quickly and accurately. In other operations, the press forms heads on bolts, legs for caster forms, and bends structural T frames.

Mercury reports very small maintenance costs, and sums up the company's satisfaction with, "It's the best!"

Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in heavy production! Farquhar Presses are built for the job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

Farquhar engineers are ready to help solve whatever production problem you may have. Give them a call.

Send for Free Catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry. Write to: A. B. Farquhar Co., *Hydraulic Press Dept.*, 1522 Duke St., York, Pa.

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"We solve depth-of-hardness problems on low hardenability steels with GULF SUPER-QUENCH"

says James Mericka, President
Steel Improvement Co., Detroit, Mich.

"One of our current jobs is quenching and drawing 1¼ x 22 in. cold-rolled pins for tank tractor treads," says Mr. Mericka, "and we have to through-harden these pins to 35-40 Rockwell C. Ordinarily this is quite a problem with some of the substitute steels, such as AISI 8150 and 8160."

"But by using Gulf Super-Quench, we've been able to meet this hardness specification on every substitute steel delivered to us. And we get a minimum of distortion and cracking with this fast-quenching oil, which results in fewer rejects and an improved profit picture."

This is typical of the results obtained in scores of metal-working plants with Gulf Super-Quench. For additional information on this quality fast-quenching oil, call in a Gulf Sales Engineer. Write, wire, or phone your nearest Gulf office.

GULF OIL CORPORATION
GULF REFINING COMPANY
PITTSBURGH 30, PENNSYLVANIA

GULF SERVES INDUSTRY

CALENDAR
OF MEETINGS

January 19-22, American Society of Mechanical Engineers and Society for the Advancement of Management: Plant maintenance conference & exposition. Public Auditorium, Cleveland. Exposition managers: Clapp & Pohak Inc., 250 W. 57th St., New York 19.

January 19-23, American Institute of Electrical Engineers: Winter general meeting. Hotel Statler, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 20, Cutting Tool Manufacturers Association: Annual meeting. Hotel Statler, Detroit. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gairing.

January 20-22, American Medical Association: Congress on Industrial Health. Drake hotel, Chicago. Association address: 535 N. Dearborn, Chicago 10. Secretary: Dr. C. M. Peterson.

January 20-22, Caster & Floor Truck Manufacturers Association: Winter meeting. Hotel Roosevelt, New York. Association address: 27 E. Monroe, Chicago. Secretary: H. P. Dolan.

January 21-22, Steel Shipping Container Institute: Winter meeting. Pierre & Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 22, American Coke & Coal Chemicals Institute: Regional meeting. Edgewater Beach hotel, Chicago. Institute address: 711 14th St. NW, Washington 5. Executive secretary: Samuel Weiss.

January 22-23, Steel Plate Fabricators Association: Annual meeting. Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago. Secretary: Dwight Evans.

January 23, Malleable Founders' Society: General meeting. Hotel Cleveland, Cleveland. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 26-28, Truck-Trailer Manufacturers Association Inc.: Annual winter meeting. Edgewater Gulf hotel, Edgewater Park, Miss. Association address: 1024 National Press Bldg., Washington. Managing director: John B. Hulse.

January 26-30, American Society of Heating & Ventilating Engineers: International heating & ventilating exposition. Grand Central Palace, New York. Society address: 51 Madison Ave., New York 10. Secretary: A. V. Hutchinson.

February 1-5, Associated Equipment Distributors: Annual meeting. Hotel Conrad Hilton, Chicago. Association address: 30 E. Cedar St., Chicago. Secretary: P. D. Hermann.

February 2, Cleveland Engineering Society: Annual machine design conference. Society offices, 2136 E. 19th St., Cleveland 15. Information: Don Cornish.

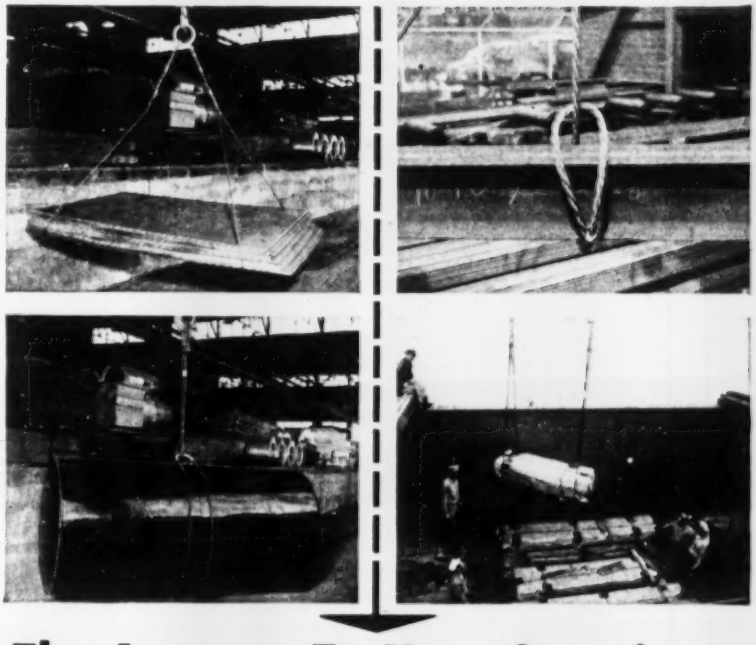
February 4-6, Computor Conference Committee, Institute of Radio Engineers and American Institute of Electrical Engineers: Western computor conference. Hotel Statler, Los Angeles. Information: G. H. West, Public Relations Dept., Consolidated Engineering Corp., Pasadena 5, Calif.

February 9-11, American Road Builders' Association: Annual meeting. Hotel Statler, Boston. Association address: 1319 F St. NW, Washington 4. Secretary: Gen. Eugene Reybold.

February 15-19, Automotive Electric Association: Annual meeting. Edgewater Beach hotel, Chicago. Association address: 502 Michigan Bldg., Detroit 26. Secretary: S. W. Potter.

February 16-19, American Institute of Mining & Metallurgical Engineers: Annual meeting. Hotel Statler, Los Angeles. Institute address: 29 W. 39th St., New York 18. Secretary: E. H. Robie.

February 16-19, Industrial Ventilation Conference: Michigan State College, E. Lansing, Mich., Co-sponsor: Division of Industrial Health, Michigan Dept. of Health. Information: K. E. Robinson, Division of Industrial Health, Lansing 4.



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2 How to get longer sling life
3 How to make hitching and unhitching easier
4 Proved ways to cut sling costs
5 How to splice wire rope — directions for socketing

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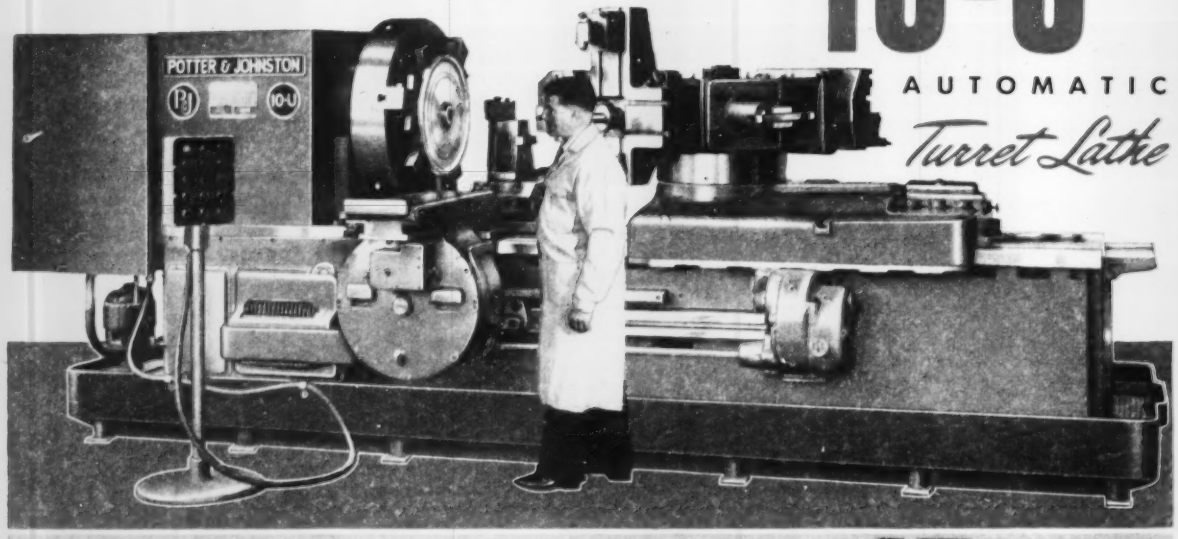
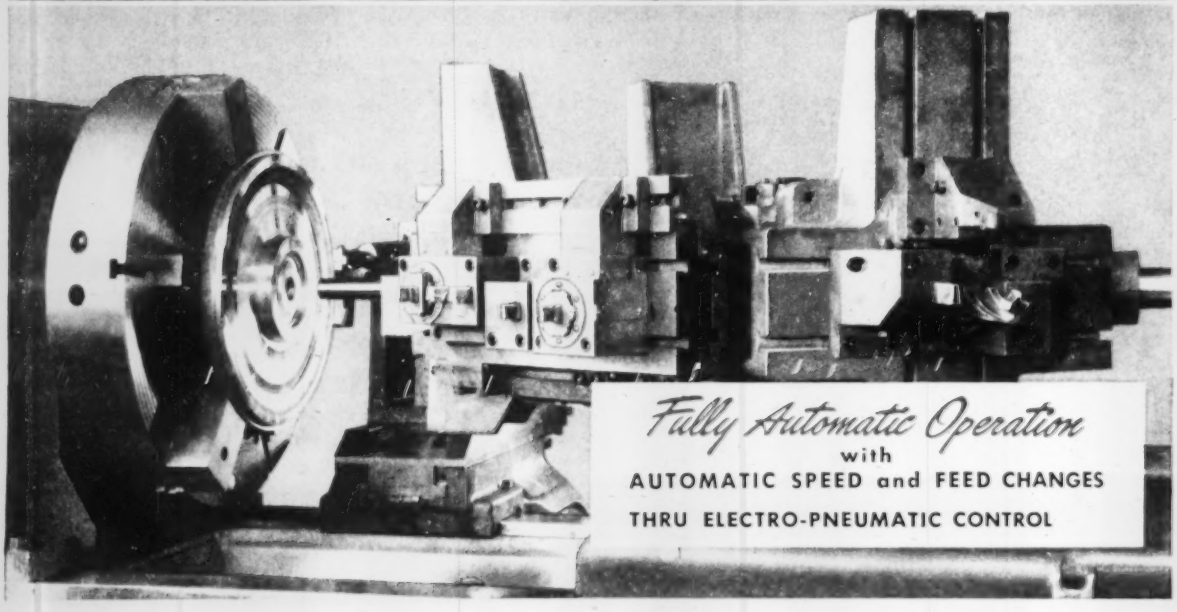
AUTOMATIC

Turret Lathe





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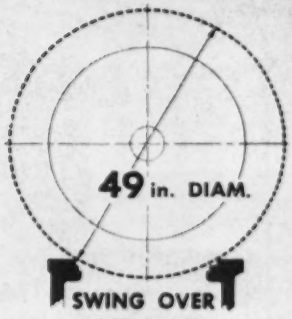
. . . AND ALL LARGE CHUCKING WORK

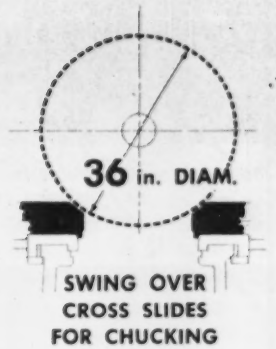
The big, powerful, new Potter & Johnston 10-U Turret Lathe now brings the advantages of fully automatic operation to your really big, hard-to-handle jobs, like this large-diameter disk for an aircraft jet engine—shown here mounted in a 36 inch chuck. The P&J-designed tooling takes full advantage of simultaneous multiple cuts to produce the finished work piece.

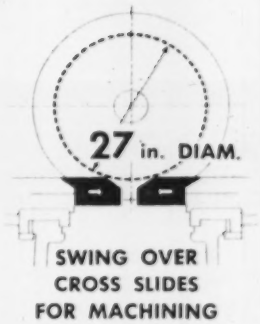
The P&J 10-U is equipped with a 75 horsepower motor, multi V-belt drive and air operated chucks. Controls are centralized in a single, convenient station. All mechanisms including the clutches are readily accessible for adjustment.

If you're doing big jobs, you'll want more information on the Potter & Johnston 10-U Automatic Turret Lathe. Send today for your copy of Bulletin 146. Write on your Company letterhead to the Pratt & Whitney Branch Office nearest you — or direct to Pawtucket, R. I.

BIG CAPACITY







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OUR Office Manager works with each member of the U. S. Steel Supply team to give you the best service of which the team is capable. He works closely with salesman, telephone salesman and credit manager to see that routine operations connected with your orders are handled to your satisfaction. His principal concern, however, is to devise ways of improving service to you wherever possible so that U. S. Steel Supply service will always be the best the industry has to offer.

If you have suggestions for the improvement of our service to you, mention them to your U. S. Steel Supply salesman or bring them directly to the attention of the Office Manager. Either way, they will receive full consideration and prompt action.

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TULSA · YOUNGSTOWN

UNITED STATES STEEL

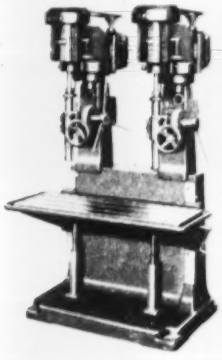
NEW PRODUCTS and equipment

Reply cards on page 115 will bring you more information on any new products and equipment in this issue

Two-Spindle Drilling Machine

. . . speeds: 65 to 1360 rpm

Heavier base and more sturdy column are two improvements incorporated in this two-spindle, 20-inch swing, model MC-20 drilling machine. Result is rigidity and



stamina required for a capacity of $1\frac{1}{4}$-inch drilling in mild steel.

Dial indicator for easy selection of geared power feeds steps up operator efficiency. A spring-loaded lever is included for changing the eight spindle speeds from 65 to 1360 rpm. Sibley Machine & Foundry Corp., Dept. ST, South Bend, Ind.

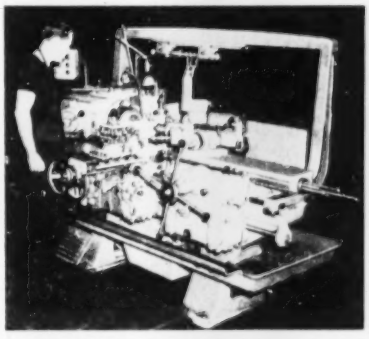
USE REPLY CARD—CIRCLE No. 1

Hydraulic Tracing Attachment

. . . expands lathe job capacity

This turret lathe hydraulic tracing attachment is built for use on Jones & Lamson ram or 7A saddle universal bar or chucking machine for general tracing, multistep shaft and contour work. Attachment is powered by a differential type cylinder. Tool-carrying slide is mounted on a 45-degree angle with the spindle axis. Cylinder stylus and cutting tool are mounted on the back of the cross slide on a bridge-type carriage, freeing the square turret for other operations on the same piece.

Tracing attachment is also applicable for turning tapers. A hard-



ened straight edge, set at desired angle, serves as a template or former. In addition to actual tracing and taper turning, attachment makes available all facilities of a turret lathe. Jones & Lamson Machine Co., Dept. ST, Springfield, Vt.

USE REPLY CARD—CIRCLE No. 2

Acid Compound Descaler

. . . overcomes acid hazards

Type 2A descaler is a dry, free-flowing acid compound that removes rust and scale from steels and alloy steels. Product is dissolved in water in concentration range from 4 ounces to 3 pounds per gallon. It overcomes hazards attendant with handling strong sulphuric or hydrochloric acid, producing a controlled acid concentration to prevent overpickling.

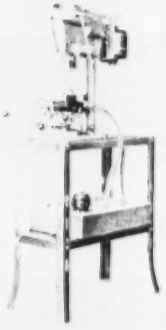
Product contains surfactants to dislodge oil films and create a foam to reduce or eliminate fumes. Effect on heavily rusted and scaled steel is seen in bright surface on half of cut above. Enthone Inc., Dept. ST, New Haven, Conn.

USE REPLY CARD—CIRCLE No. 3

High-Production Turner

. . . capacity to 1¾-inch bars

Smaller model Turnomat turning attachment for lathes and drill presses is offered as a complete machine. Designed to release larger lathes for other production work,



the model's capacity reaches $1\frac{3}{4}$-inch bar stock. Its four interchangeable heads cover a range from 1/32-inch. Machine is built to turn to small diameters in one plunge cut. Turnomat Co. Inc., Dept. ST 28, Brockport, N. Y.

USE REPLY CARD—CIRCLE No. 4

Surfacing Material

. . . resists corrosion, abrasion

Ceilcrete is a combination of synthetic liquid resin, inert fillers and pigments and cures into a hard dense stone-like corrosion - proof surface that will withstand truck-

IN HOCKEY, "goalies" are trained to give protection from any angle.

In like manner, Worcester Stamped Metal engineers seek to give complete customer protection. They eliminate unnecessary operations and expense in the fabrication of metal stampings and — in many cases, their "know how" improves design specifications and reduces cost factors.

Further protection of the customer's interests is assured by recent expanded manufacturing facilities. A new, modern building makes available the right press for the job and quick, efficient service.

If you have a problem that concerns the use of light, heavy or deep drawn stampings, we suggest you make inquiry early in the planning stage.

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ing, foot traffic and abrasion with a high rated strength for load carrying.

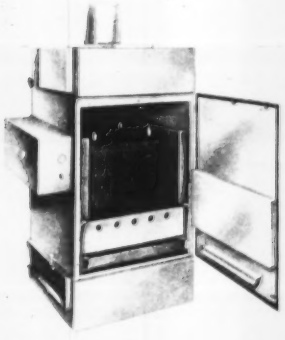
It is trowelled on concrete surfaces of tanks, walls, floors. Material resists solvents, acids and alkalis and is nonsparking and nonslip. Ceilcote Co., Dept. ST, 4832 Ridge Road, Cleveland 9, O.

USE REPLY CARD—CIRCLE No. 5

Oil Mist Control

. . . recovers machining coolant

Self-contained Precipitron oil mist control unit recovers coolant oil from mist and smoke generated by high speed machining. Control is available in two models: Type PO-6 has air handling capacity of



600 cfm; PO-12, 1200 cfm. Control unit is designed to be completely self contained.

In addition to coolant oil salvage, recovery includes advantages in reduced industrial hazards, savings in heating costs, improved employee relations and lower maintenance costs. The power pack operates from a single-phase, 115 v line, consuming less than 60 w when operating. Sturtevant Division, Westinghouse Electric Corp., Dept. ST-509, 200 Readville St., Hyde Park, Boston 36, Mass.

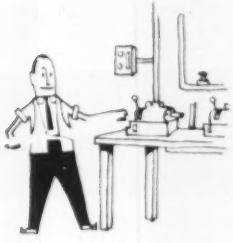
USE REPLY CARD—CIRCLE No. 6

Liquid Resin

. . . for sand core bonding

Durez 16039 is a phenolic type liquid resin for sand core bonding. It is claimed that cores made with this resin are suitable for use in making castings from aluminum, bronze, gray iron, malleable iron and steel. It is soluble in water, but upon curing either in ovens or

You reach all 4



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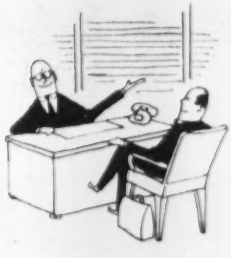
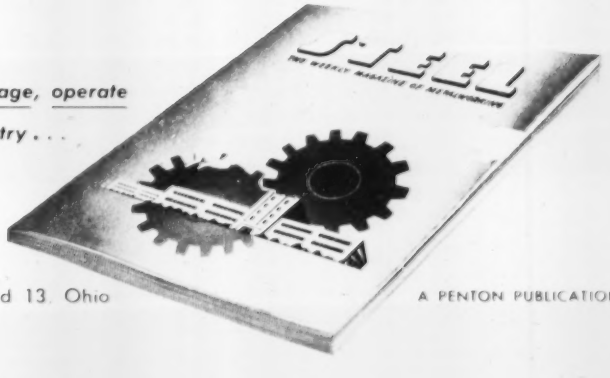


metalworking

operations . . .

The magazine of the men who manage, operate and buy for the metalworking industry . . .



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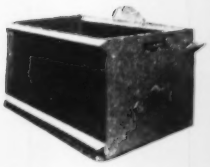
A PENTON PUBLICATION

WHY USE 3 TO 5 TRUCKS... WHEN ONLY ONE WILL DO?

In many plants a Dempster-Dumpster, like the one above, operated by only one man, the driver, has replaced 3 to 5 conventional trucks and crews. The reason for this is that one truck-mounted Dempster-Dumpster serves scores of Dempster-Dumpster Detachable Containers up to four times the capacity of the average dump truck body. These containers are built in a wide variety of designs best suited to the type of materials handled. Be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish. Containers are conveniently located at accumulation points inside and outside buildings. To illustrate the flexibility of the Dempster-Dumpster System in handling all types of materials in your plant, we show, at right, a few of the dozens of Dempster-Dumpster Containers built to meet every bulk materials handling need. And remember, one truck-mounted Dempster-Dumpster handles all containers, regardless of capacity or design.

The Dempster-Dumpster System eliminates standing idle time of crews and trucks . . . eliminates re-handling of materials . . . increases efficiency, sanitation and good housekeeping . . . cuts cost of truck equipment and operation tremendously. Without question, it's the most efficient and lowest cost method of bulk materials handling by truck ever devised! The chances are this system will save you thousands of dollars annually. This equipment manufactured and sold exclusively by Dempster Brothers, Inc.

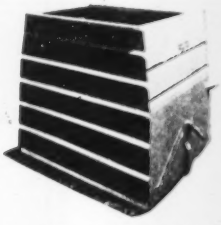
WHEN A CONTAINER IS FULL, the Dempster-Dumpster picks it up, hauls to destination and dumps the materials or sets load down intact. These three simple operations, shown above, are hydraulically controlled by driver in truck cab.



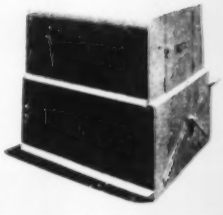
Drop Bottom Container built up to 10 cu. yd. capacity to handle heavy materials.

Tank Type Container meeting A.S.M.E. specifications. Capacities up to 1,200 gallons.

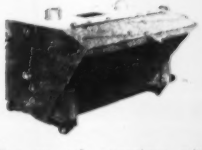
Tilt Type with Converged Lip for handling fine aggregate, wet or fluid materials.



Drop Bottom Pressed Steel Type for lighter service.



Universal Type built up to 12 cu. yd. capacity with top and end doors.



Five cu. yd. container with swivel casters for handling waste blast sand.

DEMPSTER BROTHERS, 613 Dempster Bldg., Knoxville 17, Tenn.

dielectric dryers, resulting cores have good water resistance. Durez Plastics & Chemicals Inc., Dept. ST, N. Tonawanda, N. Y.

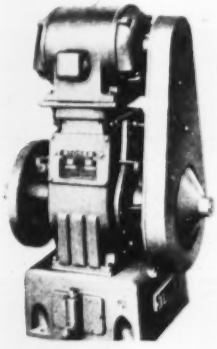
USE REPLY CARD—CIRCLE No. 7

High-Vacuum Pump

. . . for metal evaporation

Applications possible with the improved model G Microvac pump include high vacuum evaporation of metals and metallic salts. New features include a shaft seal redesigned to minimize maintenance requirements.

There are no stuffing boxes, no



valves, no adjustments. Lubrication is automatic, freedom from leakage assured.

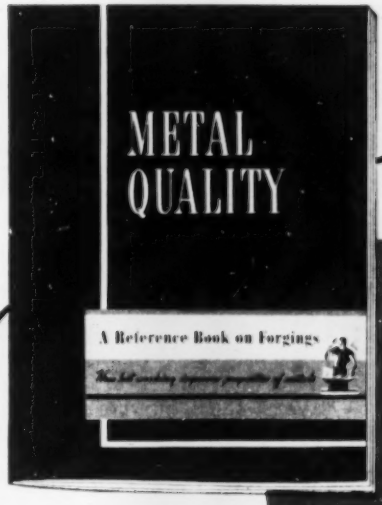
Valve stops prevent copper-beryllium springs from reaching coil-to-coil compression at any time. These stops also permit use of the pumps in a broad application range including rapid cycling evacuation of large-volume systems. Side entrance intake acts as a baffle against entering solids; added protection is afforded by a screen filter. F. J. Stokes Machine Co., Dept. ST, 5500 Tabor Rd., Philadelphia 20, Pa.

USE REPLY CARD—CIRCLE No. 8

Floor-Type Universal Tester

. . . built for large specimens

Universal testing machine has 4 x 15-foot finished machine bed pad. The floor-type unit is designed especially for large specimens, such as bridging members, aircraft wings and concrete columns. Crosshead is driven by a Thymotrol motor mounted directly on the crosshead. Raising and lowering crosshead on fixed screws permits a



Engineering, production and economic advantages obtainable with forgings are presented in this Reference Book on forgings. Write for a copy.

FORGINGS ARE UNUSUALLY EFFECTIVE FOR SOLVING PROBLEM PART PROBLEMS

A problem part problem, however complex, often ceases to be a problem once all the aspects of the part are checked with the unrivaled economic and mechanical advantages of closed die forgings and the closed die forging process for producing parts. Whatever the nature of problems that make a problem part, consult a forging engineer to determine the extent to which forgings can help you solve them.

DROP FORGING ASSOCIATION
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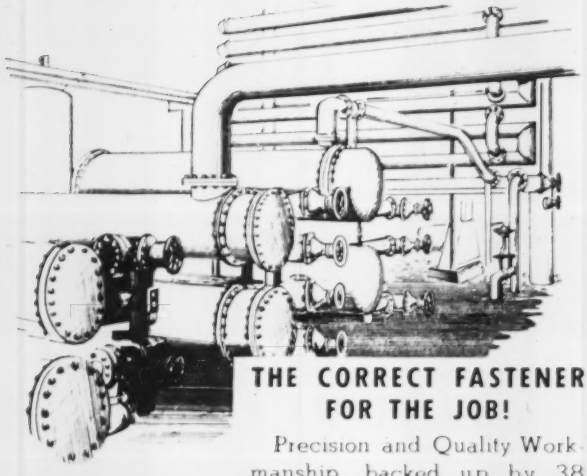

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NEW PRODUCTS and equipment

more direct and rigid drive with less torsion.

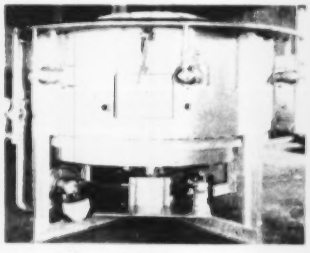
The 200,000-pound tester's speed range is 20 to 1, providing overall loading speed of 0.025 to 0.5 inches per minute. Traverse speed: 15 inches per minute. Special flexure plate construction in each plane allows eccentric loads to be used. Young Testing Machine Co., Dept. ST, Skelton Bldg., Bryn Mawr, Pa.

USE REPLY CARD—CIRCLE No. 9

Rotary Hearth Furnace

. . . has long flame burners

Furnace has 7-foot, 6-inch outside diameter hearth, with a 30-inch column. Chamber height is 15 inches. Center column forms a doughnut-shaped heating chamber.



Burners fire tangentially of the inner lining and against the direction of table rotation.

Furnace is controlled by a Leeds and Northrup strip chart instrument. Unit can be used for temperatures of 1200 to 2300° F. Waltz Furnace Co., Dept. ST 1, 1901 Symmes St., Cincinnati, 0.

USE REPLY CARD—CIRCLE No. 10

Liquid Belt Lube

. . . sprayed on as fine mist

Packaged in pressure cans, this liquid lubricant is released in a fine mist by pressing the nozzle with the finger. Product revitalizes leather, rubber or fabric transmission belts, restoring flexibility, prolonging life and stopping slippage. Alexander Brothers Belting Co., Dept. ST, Philadelphia, Pa.

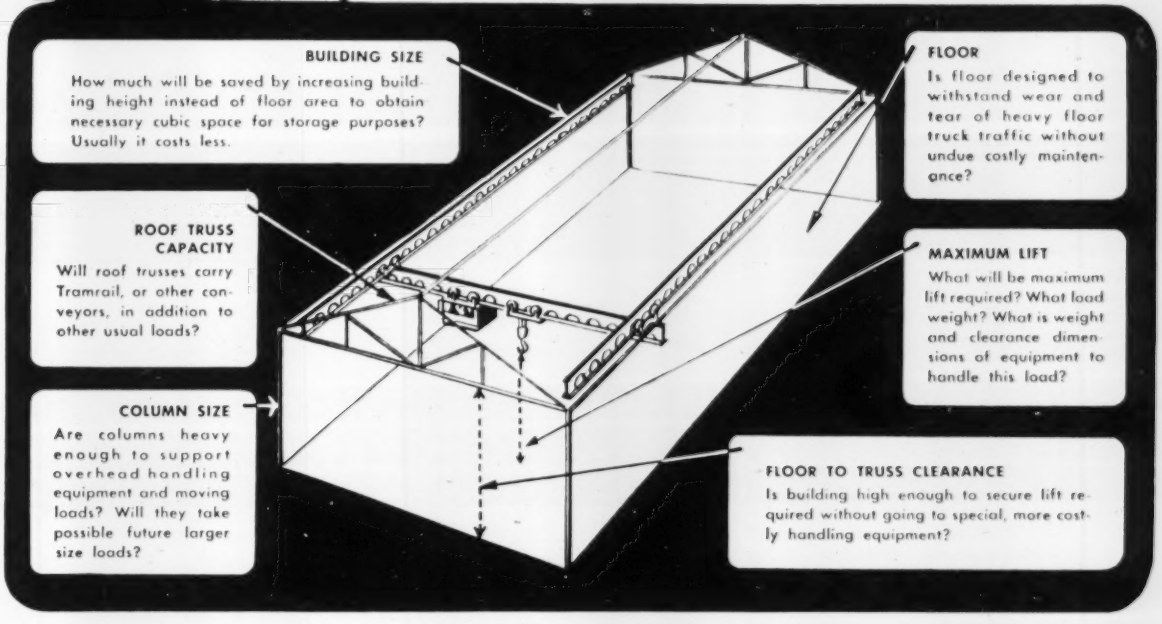
USE REPLY CARD—CIRCLE No. 11

Hydraulic Filter Units

. . . pumps oil from machine

Portable hydraulic filter units are used for pumping hydraulic oil

Don't Forget *Materials Handling* When Designing the Building


BUILDING SIZE
How much will be saved by increasing building height instead of floor area to obtain necessary cubic space for storage purposes? Usually it costs less.
ROOF TRUSS CAPACITY
Will roof trusses carry Tramrail, or other conveyors, in addition to other usual loads?
COLUMN SIZE
Are columns heavy enough to support overhead handling equipment and moving loads? Will they take possible future larger size loads?
FLOOR
Is floor designed to withstand wear and tear of heavy floor truck traffic without undue costly maintenance?
MAXIMUM LIFT
What will be maximum lift required? What load weight? What is weight and clearance dimensions of equipment to handle this load?
FLOOR TO TRUSS CLEARANCE
Is building high enough to secure lift required without going to special, more costly handling equipment?

The foremost demand of a new factory building, whether for production or storage, is that its design and construction aid overall operating efficiency to the utmost. Thus, the building becomes more than just an enclosure, but is actually a vital part of the manufacturing process.

It is, therefore, imperative that the various steps entering into the making of an item be thoroughly considered when the building is designed. One of the most important of these concerns materials handing because this item often amounts from 25% to 50% of the total production cost, and, also, because it is plant-wise in nature.

Regardless of what handling methods are deemed best, overhead cranes or Tramrail, roller or chain conveyors, floor trucks, etc., the building design, size and construction usually has a tremendous bearing on the ultimate handling efficiency secured. Building clearances, floor construction, column locations, aisleway allowances and other factors must be considered for the different handling methods for most satisfactory results.

For initial economy in installation, for most satisfactory operation and highest efficiency, plan for materials handling when you design the building. ***Do not make materials handling an afterthought.***

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THE CLEVELAND CRANE & ENGINEERING CO.
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when it's equipped with versatile LAKE ERIE *hydraulic presses*

Norris-Thermador Corp. provides another excellent example

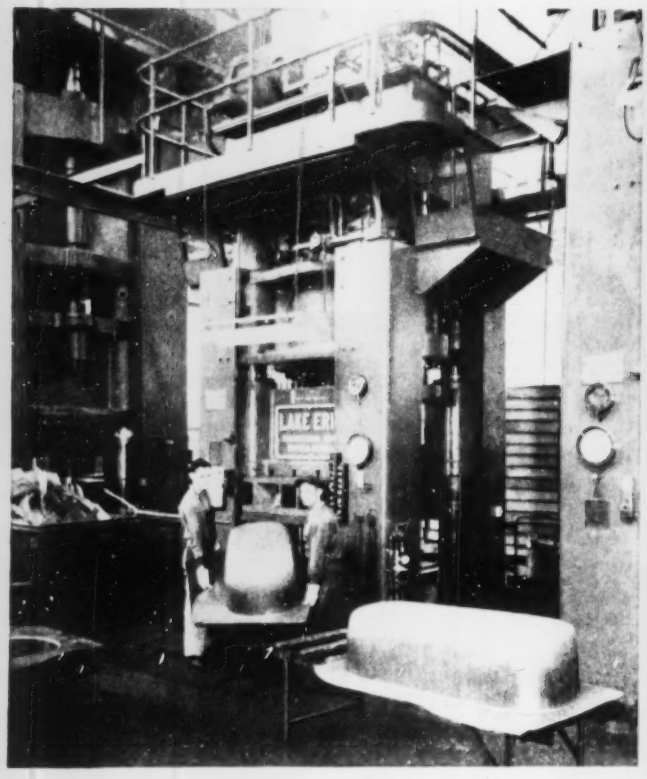
YESTERDAY...
it was bathtubs

TODAY...
it's shell casings

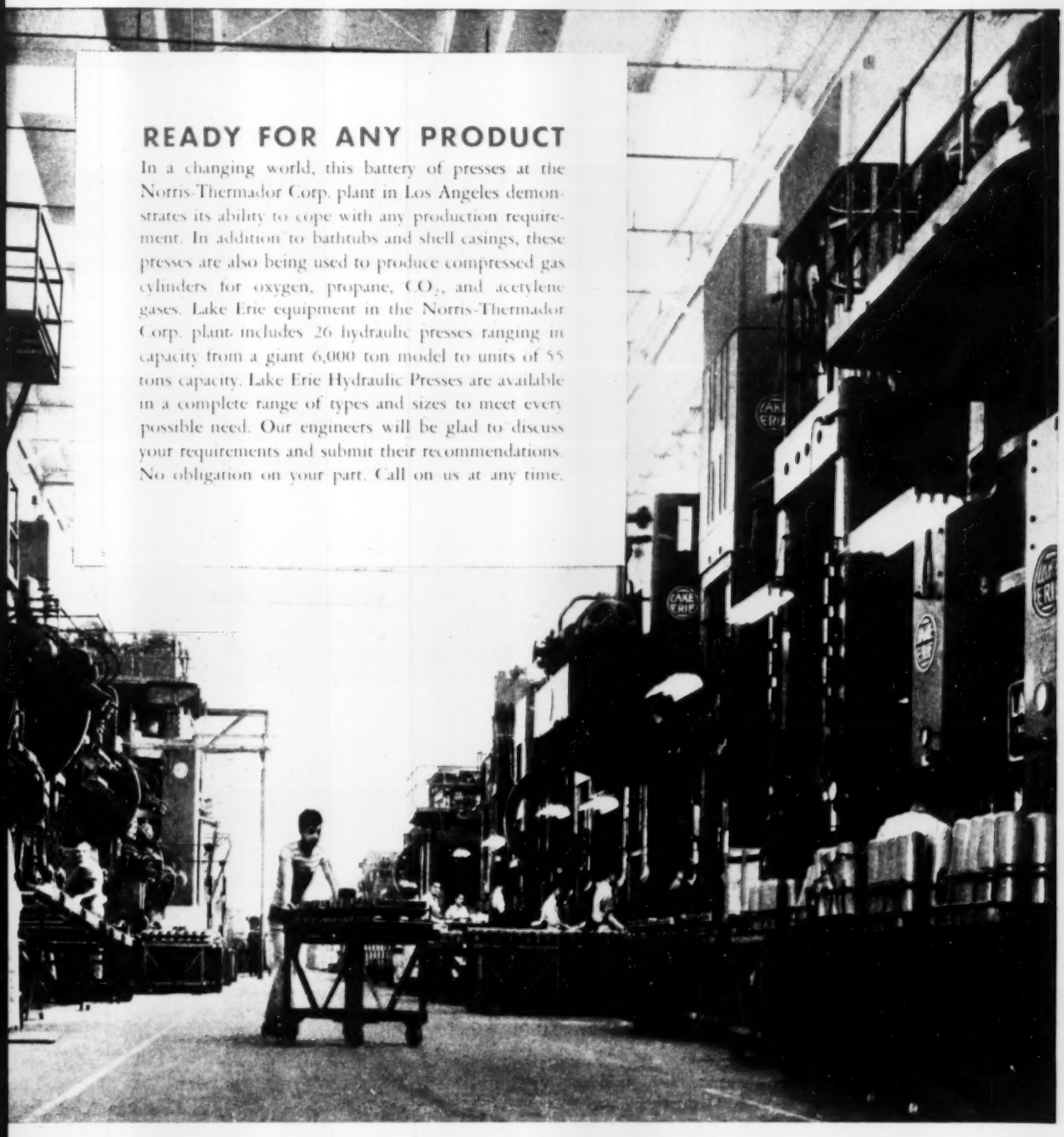
TOMORROW...
it may be another metal product

BUT...
these hydraulic presses will be ready for it.

Plant versatility is a mighty important asset... particularly today when products and markets are so prone to change on such short notice. When this versatility is coupled with high production efficiency, as it is with the fast Lake Erie hydraulic presses available today, your plant is equipped to return maximum yield on your investment. No matter what change-over you encounter—military to civilian, or vice versa...a model switch...the introduction of a new product...versatile and efficient Lake Erie Hydraulic Presses will enable you to make the change with a minimum of money, time and retooling. Why not investigate these advantages of Lake Erie Hydraulic Presses? Write or call us. No obligation.



● One of 26 Lake Erie Hydraulic Presses in the Norris-Thermador Corp. plant demonstrates its remarkable versatility. At left—drawing bathtubs, right—heading 105 mm shell casings.



READY FOR ANY PRODUCT

In a changing world, this battery of presses at the Norris-Thermador Corp. plant in Los Angeles demonstrates its ability to cope with any production requirement. In addition to bathtubs and shell casings, these presses are also being used to produce compressed gas cylinders for oxygen, propane, CO_2, and acetylene gases. Lake Erie equipment in the Norris-Thermador Corp. plant includes 26 hydraulic presses ranging in capacity from a giant 6,000 ton model to units of 55 tons capacity. Lake Erie Hydraulic Presses are available in a complete range of types and sizes to meet every possible need. Our engineers will be glad to discuss your requirements and submit their recommendations. No obligation on your part. Call on us at any time.

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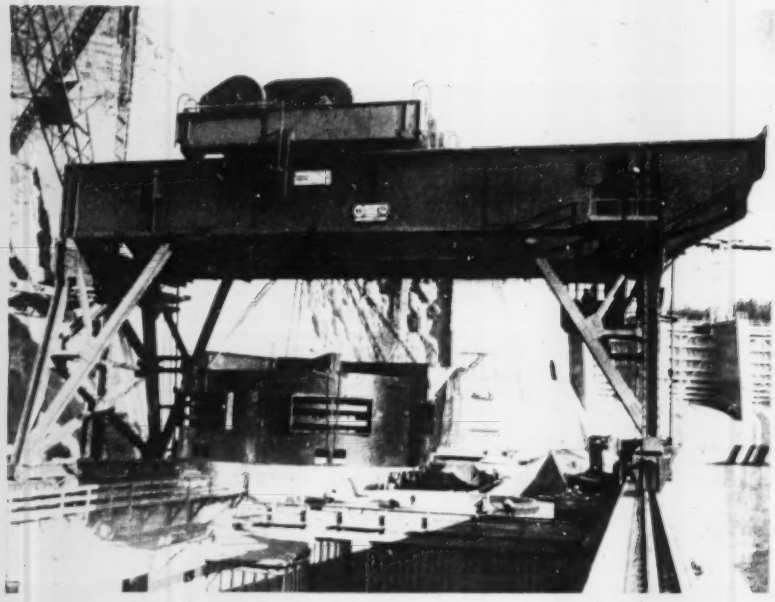

Bedford Gantry Crane, installed by Ebasco Services, Inc., for Washington Water Power Co., Spokane, at their new Cabinet Gorge Hydro Electric Station near Clark Fork, Idaho. Conservatively rated at 275 tons, crane easily handles massive rotors up to 330 tons.

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NEW PRODUCTS and equipment

from a machine, through the filter and back into the machine or into tanks for transport or storage. J. N. Fauver Co. Inc., Dept. ST, 49 W. Hancock, Detroit 1, Mich.

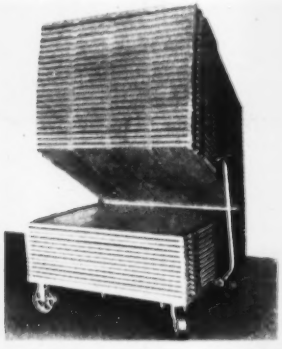
USE REPLY CARD—CIRCLE No. 12

Multitier Leaf Truck

. . . for handling between jobs

Useful for handling between operations, this multitier spring leaf truck is effective where materials should not contact each other. Base is heavy steel channel stock; tiers are hinged individually to the heavy-duty upright frame.

Each leaf can be locked in semi-up position by two coil springs, one



on a side. Rugged welded steel casters insure maximum mobility, but skid base types are available if required. Units are moved easily by hand or lift truck, can be made in any size with desired spacing between tiers. Rack Engineering Co., Dept. ST, Connellsville, Pa.

USE REPLY CARD—CIRCLE No. 13

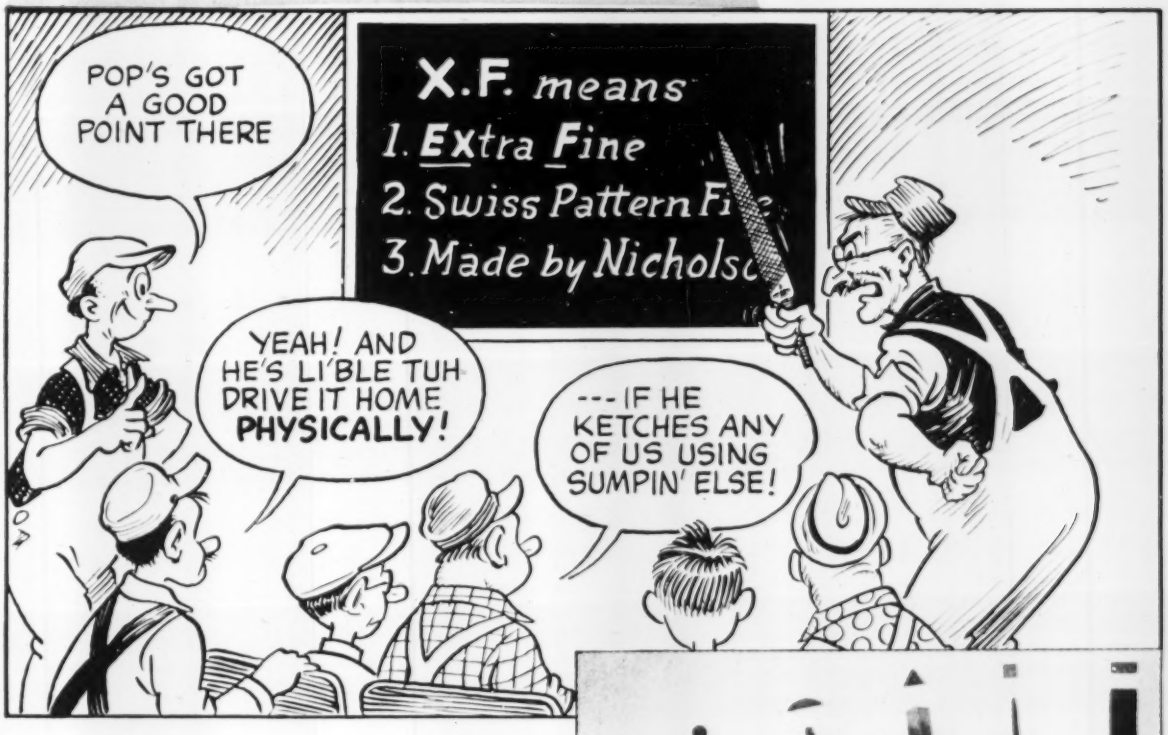
Production Casting Machine

. . . 90 complete molds per hour

Principle of this casting machine involves a simple rubber pneumatic diaphragm with a minimum of moving parts. In operation, sand is compressed in the pattern to a uniform mold hardness by inflating the diaphragm with air. Uniform mold hardness is governed by controlling air pressure injected into the diaphragm.

Each half of the model's flask is 36 inches wide, 80 inches long and 10 inches high. It produces at the rate of 90 complete molds per hour. Manufacturer reports the ma-

POP'S school of Filing


POP'S GOT A GOOD POINT THERE
X.F. means
1. EXtra Fine
2. Swiss Pattern Fi
3. Made by Nicholso
YEAH! AND HE'S LI'BLE TUH DRIVE IT HOME PHYSICALLY!
--- IF HE KETCHES ANY OF US USING SUMPIN' ELSE!

THEY can't put anything over on Pop. He knows (as most good foremen know) that where there's precision filing to be done, there are specially precise files for doing it, viz.: Nicholson X.F. Swiss Pattern Files. He knows, too, that "X.F." means "*Extra Fine*." And for good reason: With 89 years' file-making experience and more Swiss Pattern production than any other manufacturer in America, Nicholson can well be expected to turn out the absolute tops in accurate shapes and cuts and the utmost in quality.

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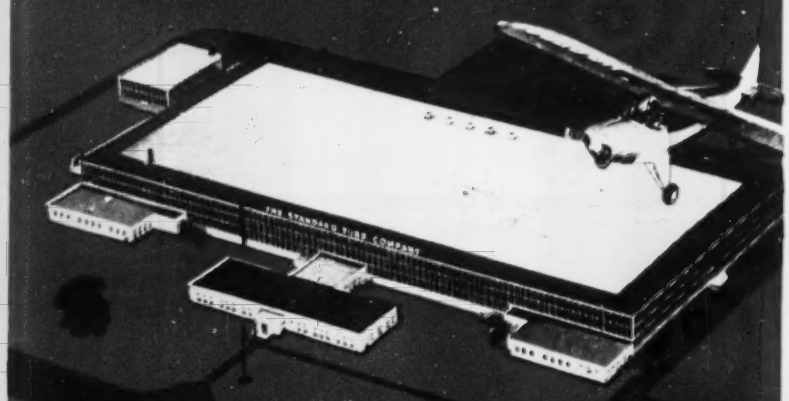

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STEEL TUBING SIZES: ½" O.D. to 5½" O.D. .028 to .260 wall
STAINLESS SIZES: ¾" O.D. to 3" O.D. .028 to .095 wall

NEW PRODUCTS and equipment

chine holds casting weights within ounces. It requires no special sand mixes and either wooden or plastic patterns can be used. Machine develops an instant molding cycle. No foundation is necessary. Taccone Pneumatic Foundry Equipment Corp., Dept. ST, North East, Pa.

USE REPLY CARD—CIRCLE No. 14

Pitch Diameter Gages

. . . check jet blade root forms

Gage speeds external and internal pitch diameter checking of root forms on jet engine blades and blade carriers. Two units are available, both used as hand gages

in conjunction with the manufacturer's standard Air-O-Limit model F comparator.

Blade root gage design incorporates a carbide roll-type anvil adjustable to accommodate various root form sizes. Gaging point is a carbide ball point spindle that operates the single air nozzle. A carbide roll pressure shoe provides positive location of gage on blade root.

Carrier gage checks pitch diameter of the internal root forms in the jet engine blade carrier. Design incorporates carbide roll-type anvil and carbide gaging roll. Gaging roll is on a pivot arm that operates the single air nozzle. Pratt

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70. Solderless Terminals

Aircraft-Marine Products, Inc.—A strikingly different 20-page booklet entitled "The Harrisburg Story" vividly describes the origin, growth, business philosophy and engineering principles of this manufacturer of "installed" wire terminations, not simply solderless terminals.

71. Turbidity Recorder

'Ess Instrument Co.—The TR-6 Turbidity recorder for measuring amount of light cut off by undissolved substance suspended in fluids is subject of bulletin 601 which emphasizes operating principles and range of applications.

72. High Pressure Pumps

American-Marsh Pumps, Inc.—Designed for countless applications including processing, compressing and hydraulic pressure testing. Triplex pumps described in 6-page illustrated folder 13-295 are available for 600 to 5000-psi service in capacities from 1.1 to 16.5 gpm. Direct drive and back geared types are covered.

73. Alloy Steel Specs

Peter A. Frasse & Co.—On one file-size card, designated as Sec. D, No. 1, you will find government specification analyses for alloy steel, showing the nearest corresponding SAE, AISI and AMS numbers.

74. Grinders & Buffers

Hisey-Wolf Machine Co.—There's a size and type of electric grinder for practically every general grinding requirement shown in 36-page illustrated catalog 72. In addition to showing such accessories as dust collectors, eye shields and guards, book gives data on angle, bench, disk, drill, external, internal, snagging, tool post, vertical spindle and other types of grinders, buffers and polishing machines.

75. Plating Rack Coating

United Chromium, Inc.—Illustrated data sheet RC-2 deals with properties and uses of Unichrome Coating 218X. This plastisol material is suitable for coating plating and conveyor racks, degreasing and dipping baskets, plating barels, drainboards, ductwork, agitators, tank grids, tanks and drums.

76. Corrosionproof Paint

Monroe Co.—4-page illustrated bulletin C-54-S states that Monco-Alochrom aluminum-chromium paint is available in several grades which are adaptable for protection of all surfaces whether interior or exterior, hot or cold. Finish forms a base coat of oil and a top coat of overlapping aluminum-chromium flakes.

77. Cast Steel Sheaves

Farrell-Cheek Steel Co.—6-page illustrated bulletin 40-GR-652 contains dimensions and application information on type 85 alloy cast steel sheaves which have clean, smooth, hard and tough "cable saver" grooves. Also covered briefly are traveling type choker hooks, standard choker hooks and wire rope sockets.

78. Furnaces & Carburizers

American Gas Furnace Co.—Construction, features, specifications and other data pertinent to oven furnaces and vertical retort gas carburizers are given in illustrated 4-page bulletins 200 and 1220, respectively. Large single and double entrance ovens which maintain 1800 to 2000° F temperatures are covered in first booklet.

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79. Industrial Sweeper

Lull Mfg. Co.—According to 2-page illustrated bulletin AID-41A the new automatic terrain compensator has been added to the entire line of Lull Sweepers. This spring-loaded float device compensates for uneven terrain automatically and maintains constant broom-ground contact pressure to assure clean sweeping.

80. Carbon Steel Bars

La Salle Steel Co.—"Your Blueprint to New Economies in the Use of Steel Bars" is title of this 12-page illustrated bulletin which outlines characteristics, uses and properties of Stressproof cold finished carbon steel bars.

81. Sheet Steel Separator

Basco Mfg. Co.—Two sizes of the Basco sheet steel separators are described and illustrated in this 2-page bulletin. One is a three-high heavy duty unit and other is smaller two high unit. Height, width, number of magnets, maximum stack height, etc., are covered.

82. Wire Rope Care & Use

A. Leschen & Sons Rope Co.—When you carry 72-page illustrated manual C-51 around in your pocket (it will fit conveniently without folding), you will have at your fingertips much practical information on the use and care of wire rope. If it concerns wire rope, the manual has it.

83. Sheet Feeding Tables

Raymond Corp.—Complete data on 1000 and 6000-lb capacity sheet feeding tables are contained in 2-page illustrated bulletin 264. These elevating tables have tilt tops and simplify many handling operations.

84. Maintenance Control

Remington Rand Inc.—Pre-scheduled controlled preventive maintenance reduces costly down-time to a minimum and eliminates the need for large emergency crews. For information on this procedure plus a system which uses visible records for maintenance control, we recommend folder KD-705.

85. Air-Operated Pumps

Lincoln Engineering Co.—Line of air motor-operated pumps and accessories for automatic dispensing and application of sealers, adhesives, roofing and caulking compounds is described and illustrated in catalog 40. Eleven standard models for spray gun, pole gun and Flo-Gun applications are shown.

86. Industrial Trucks

Lewis-Shepard Products Inc.—In 18 illustrated pages, catalog 34 describes two units in Master line of industrial trucks—the Jacklift Electric and Master Jackstacker. Engineering and operating features are covered and engineering drawings, specs and maintenance features are included.

EDITORIAL REPRINTS:

87. Drives & Controls

Reprints comprising the "Forum on Technical Progress" in STEEL's Metalworking Yearbook Issue includes one on "Drives and Controls." Special emphasis is given to trends in the uses of adjustable speed drives, servomechanisms, worm gears, hydraulics and pneumatics. These are cited as the answer to today's demand for faster, more reliable production tools.

88. Cleaning & Finishing

"Cleaning and Finishing" is title of STEEL Yearbook reprint which reviews the progress of surface treatment technology in 1952. Nickel restrictions forced platers to search for substitute finishes. The pay-off was better corrosion-resistance and improved appearance.

89. Inspecting & Testing

Scientific inspection in early stages of manufacture not only finds flaws but helps prevent them. Progress made in field of radiography in past year, which includes atomic radiation and the use of Cobalt 60, comes under discussion in informative Yearbook reprint "Inspecting and Testing."

90. Heat Treating

With today's equipment and control, production men are turning out carburized or heat treated parts having necessary properties to meet any engineering requirement. In STEEL Yearbook reprint entitled "Heat Treating" is reported advances made in this operation with reference given to boron steels in role carbon plays, carburizing equipment and quenching.

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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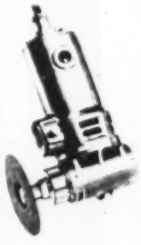
& Whitney, division of Niles-Bement-Pond Co., Dept. ST, W. Hartford 1, Conn.

USE REPLY CARD—CIRCLE No. 15

High-Speed Hand Tool

. . . incorporates collet chuck



Portable high speed hand tool is applicable for precision grinding or cutting jobs on production or maintenance work. Model B-2 Diskette has no-load spindle shaft speed of about 9000 rpm, is limited to a 4-inch disk.

Improvements in the current model include use of a cast aluminum air intake cover and double-cooling fan to increase cooling efficiency. Instead of a separate collet chuck available for attachment, the B-2 model incorporates the chuck in the spindle. Result is reduced overhang on some attachments by almost 1 inch. This assures accurate centering. Franklin Balmar Corp., Dept. ST, 3500 Clipper Rd., Baltimore, Md.

USE REPLY CARD—CIRCLE No. 16

Capacitor Equipment

. . . for wye or delta systems

The 300-kvar, open-type, automatically switched capacitor equipment for 15-kv ungrounded wye or delta systems has a basic impulse level of 95 kv. The 25-kvar capacitors are mounted on pedestal insulators to provide increased insulation. For protecting equipment from voltage surges, 15 kv lightning arresters may be used. General Electric Co., Dept. ST, Schenectady 5, N. Y.

USE REPLY CARD—CIRCLE No. 17

USE A REPLY CARD

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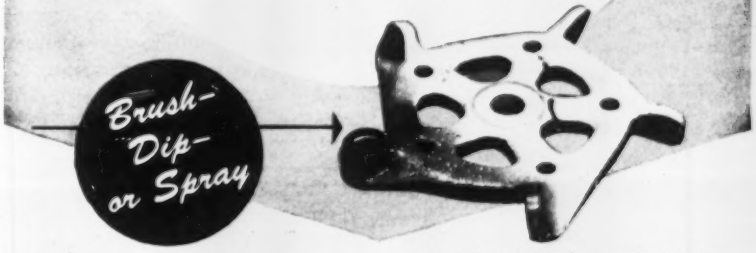

Typical casting crack as revealed by Spotcheck in sampling or maintenance inspection

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Pint Cans	——	——	$4.00 ea.	(12 cans) $2.25 per can	$4.00 ea.	(12 cans) $2.00 per can
Quart Cans	——	——	$6.00 ea.	(5 cans) $4.00 per can	$5.00 ea.	(5 cans) $3.00 per can
1-Gallon Cans	$3.00 ea.	(10 gallons) $2.50 per gal.	$15.00 ea.	(10 gallons) $14.00 per gal.	$9.00 ea.	(10 gallons) $8.50 per gal
5-Gallon Cans	$2.50 per gal.	(50 gallons or more) $2.00 per gal.	$13.00 per gal.	(50 gallons or more) $10.00 per gal	$7.50 per gal.	(50 gallons or more) $7.00 per gal

All prices F.O.B. Chicago, Illinois. Spotcheck Inspection requires application of Cleaner, Penetrant and Developer. Order quantity desired of each on your company purchase order.

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The Market Outlook

THERE'S new evidence that a balance between steel supply and demand continues to approach.

In the East, pressure on warehouses for steel is easing slightly. First apparent in tool steels and other specialties, the trend now extends over more finished steel products. Warehouses in that area also note a reduction in inquiries from large buyers who deal directly with the mills when steel is available but who fall back on higher-priced warehouse steel when mills can't supply all their needs.

BONUS—Another indication of the improvement in supply and demand balance is the possibility that National Production Authority will give civilian consumers, such as producers of stoves, refrigerators and similar goods, a second-quarter allotment of steel equal to 90 per cent of the amount they used in the average quarter prior to the Korean war. They were previously scheduled to get only 70 per cent. Copper and aluminum allotments to these consumers will be boosted also.

A FORECAST—The continued march toward a matching of demand and supply should put the average consumer's steel inventory in balance by July 1, the NPA believes. It is estimated conservatively that 5 million to 7 million tons of finished steel (equivalent to three to four weeks' production) will be necessary to rebuild balanced inventories equal to 60 days' full requirements. At the present rate of consumption this will take six months.

PINCHED—Many steel consumers have plenty of some finished steel products but they lack certain other needed forms.

Another change that stands out in the demand picture is a decline in inquiries for large diameter fabricated pipe, a product that has been booked up far ahead for the expansion in the nation's pipelines. This decline reflects completion of some of the major lines. However, further new programs are being developed. Pipe fabricators expect a spurt in demand from Canada before long.

Contrary to most estimates, relief in the shortage of sheets is coming first in galvanized sheets. Hot rolled and cold-rolled carbon sheets continue in very strong demand.

SPOTTY—Improvement in balance between steel supply and demand is spotty. All products and all geographical areas of the country are not affected alike.

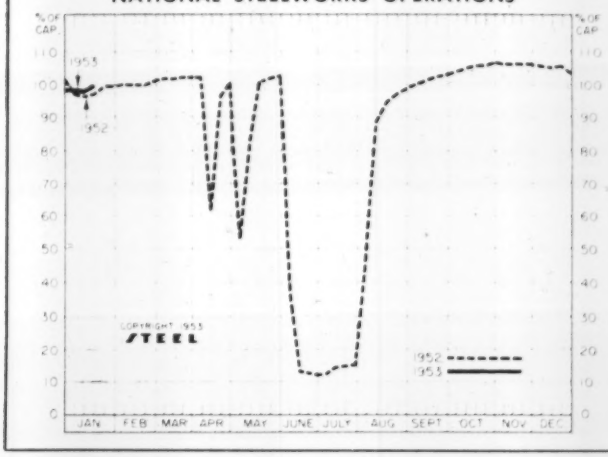
Products in fairly free supply throughout most of the country are bolts and nuts, nails, merchant wire, some types of manufacturers wire, wire rope, tool steel, hot-rolled and cold-rolled bars under an inch in diameter, floor plate, welded pipe 3 inches and under, welded carbon mechanical tubing, tin plate, terne plate, tin mill black plate, straight chrome stainless steel and merchant pig iron.

HEADACHES—Making the steel buyers' job difficult is the insufficiency of such major products as hot-rolled and cold-rolled carbon sheets, hot-rolled and cold-finished carbon and alloy bars over 1 inch in diameter and heavy and wide sheared carbon plate.

Demand for structural steel has been held down to some extent by government restrictions on construction but mills still are booked full for this product. The restrictions now, however, are less severe than they were. In an effort to obtain the structural tonnage they need, fabricators on the East Coast are buying an increasing amount of foreign structurals. Also encouraging purchase of this foreign steel are reductions in the price of it to around 5 cents a pound net, Boston dock. The most prevalent prices of U. S. mills in the eastern part of the country is 3.85 to 3.90 cents.

RECORD BREAKER—The over-all strong demand for steel continues to bring out new production records. Latest one was set in the week ended Jan. 17 when output of steel for ingots and castings was at 99.5 per cent of capacity. This yielded 2,243,000 net tons. Rate of output in the week ended Jan. 10 was 98 per cent. Capacity now is 2,254,459 net tons per week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Jan 17	Change	Same Week 1952	Same Week 1951
Pittsburgh	100.+	0*	99	100
Chicago	100	0.5*	101	101
Mid-Atlantic	94	0*	101	99.+
Youngstown	106	0	106	106
Wheeling	101	0	100.+	92
Cleveland	100.+	1.5*	102.+	100
Buffalo	100.5	0	104	104
Birmingham	97.5	0*	104	104
New England	80	0	80	80
Cincinnati	93	0	103	102
St. Louis	93	0	98	94
Detroit	101.+	2.5*	103	103
Western	100.+	3.+	97	103
Estimated national rate	99.5	1.5	97	99.+

*Change from revised rate for preceding week.

Estimated national, Mid-Atlantic and Birmingham rates are based on Jan. 1, 1953 capacities; others on Jan. 1, 1952 capacities.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,027,660 tons in 1952; 1,990,038 tons in 1951.

The Metalworking Outlook p. 37 Production Engineering News p. 73

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Jan. 13 1953	Jan. 6 1953	Month Ago	December Average
(1947-1949 = 100)	130.7	130.7	130.6	130.6

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Jan. 13, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.915
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv. buttweld (100 ft)	8.997
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.149	Wire, carbon, merchant	6.675
Bars, carbon	4.100	Wire, fence, galv.	6.458
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.720

FINISHED PRICE INDEX, Weighted Calculated by STEEL*

	Jan. 14 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.98	132.93
Index in cents per lb	4.912	4.912	4.912	4.657	3.601

ARITHMETICAL PRICE COMPOSITES Calculated by STEEL*

Finished Steel, NT	$119.98	$119.98	$119.98	$106.32	$78.18
No. 2 Fdry. Pig Iron, GT	54.04	54.04	54.04	52.24	39.50
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.42
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.28
Steelmaking Scrap, GT	42.00	42.00	42.00	42.00	41.92

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Jan. 14 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.60	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.40
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.40
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.675	4.675	4.675	4.45	3.55
Sheets, C.R., Chicago	4.675	4.675	4.675	4.45	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	4.675	4.675	4.675	4.50	3.55
Strip, H.R., Pittsburgh	3.75-4.25	3.75-4.25	3.75-4.25	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.550	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.00	5.30-6.00	5.30-6.00	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Nails, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.70
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.00	$70.00	$70.00	$66.00	$46.50
Wire rods, ¼" to ⅜", Pitts.	4.425	4.425	4.425	4.10-30	3.05

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic, Valley	54.00	54.00	54.00	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry., del. Phila.	59.25	59.25	59.25	57.11	42.504
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry. (Birmingham) del. Cin.	58.93	58.93	58.93	56.43	40.74
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	52.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	141.00*

*Eckb. cars, Pittsburgh

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$30.00
No. 1 Heavy Melt., E. Pa.	41.50	41.50	41.50	42.50	30.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	29.25
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	30.25
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	43.00	29.75
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	33.00
Rails, Rerolling, Chicago	52.00	52.00	52.00	52.00	40.00
No. 1 Cast, Chicago	43.00	43.00	43.00	49.00	42.00

Eckb. shipping point

COKE, Net Ton					
Beehive, Furn. Connsvl.	$14.75	$14.75	$14.75	$14.75	$12.00-13.00
Beehive, Fdry. Connsvl.	17.00	17.00	17.00	17.50	14.00-15.00
Oven, Fdry., Chicago	24.50	24.50	24.50	23.00	18.00

PIG IRON

Eckb. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38		
Birmingham R2	50.88	51.38		
Birmingham S8		51.38		
Woodward, Ala. W13	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo R2	54.50	55.00	55.50	
Buffalo H1	54.50	55.00	55.50	
Tonawanda, N.Y. W12	54.50	55.00	55.50	
So.Tonawanda, N.Y. T6		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester, N.Y. del.	57.52	58.02	58.52	
Syracuse, N.Y. del.	58.62	59.12	59.62	
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50		55.00	
IndianaHarbor, Ind. I-2	54.50		55.00	
So.Chicago, Ill. W14	54.50	55.00	55.00	
So.Chicago, Ill. Y1	54.50	55.00	55.00	
So.Chicago, Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich. del.		61.30	61.30	
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	
Akron, O. del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N5	54.50			55.50
Duluth I-3			55.00	
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1		59.50	60.00	
Fontana, Calif. K1	60.50	61.00		
GraniteCity, Ill. G1	56.40	56.90	57.40	
St.Louis, del. city tax	57.14	57.65	58.15	
Ironton, Utah C11	54.50	55.00		
Geneva, Utah C11	54.50	55.00		
LoneStar, Tex. I6	56.50	57.00	57.00	
Minnequa, Colo. C16	56.50	57.00	57.00	
Rockwood, Tenn. T3			58.50	
Pittsburgh District				
NevilleIsland, Pa. P6		55.00	55.00	55.50
Pitts., N&S sides, Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.16	57.16	57.66
Brackenridge, del.		57.16	57.16	57.66
Bessemer, Pa. U5	54.50		55.00	55.50
Clairton, Rankin, So.Duquesne, Pa. U5	54.50			
McKeesport, Pa. N3	54.50			55.50
Monessen, Pa. P7	56.50			
Sharpsville, Pa. S6			55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	
Youngstown Y1	54.50	55.00	55.00	
Youngstown U5	54.50			55.50
Mansfield, O. del.	59.15	59.65	59.65	60.15

*Low phos. southern grade

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade. 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton	
(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)	
NiagaraFalls, N.Y. P10	$91.00
Keokuk, Iowa, Openhearth & Fdry. I11, allowed K2	92.50
Keokuk, OH & Fdry. I2, briquettes 16% Si, I11 allowed K2	95.50
Wenatchee, Wash., OH & Fdry. I11, allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton	
(Low phos semi-cold blast, differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	60.65
Troy, N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Jan. 15, 1953, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 $51.00
Munhall,Pa. U5 54.00
Seattle S24 55.00

INGOTS, Alloy (NT)
Detroit R7 $57.00
Fontana,Calif. K1 63.00
Houston S5 65.00
Midland,Pa. C18 57.00
Munhall,Pa. U5 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 $56.00
Clairton,Pa. U5 56.00
Ensley,Ala. T2 56.00
Fairfield,Ala. T2 56.00
Fontana,Calif. K1 58.00
Gary,Ind. U5 56.00
Johnstown,Pa. B2 56.00
Lackawanna,N.Y. B2 56.00
Munhall,Pa. U5 56.00
So.Chicago,Ill. U5 56.00
So.Duquesne,Pa. U5 56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 $70.00
Buffalo,N.Y. R2 70.00
Canton,O. R2 70.00
Clairton,Pa. U5 70.00
Cleveland,O. R2 70.00
Conshohocken,Pa. A3 72.00
Detroit,Mich. R7 73.00
Ensley,Ala. T2 70.00
Fairfield,Ala. T2 70.00
Fontana,Calif. K1 70.00
Gary,Ind. U5 70.00
Geneva,Utah C11 70.00
Houston,Tex. S5 78.00
Johnstown,Pa. B2 70.00
Lackawanna,N.Y. B2 70.00
Los Angeles,Calif. B3 80.00
Munhall,Pa. U5 70.00
Seattle,Wash. B3 80.00
So.Chicago,Ill. R2 U5 W11 70.00
So.Duquesne,Pa. U5 70.00
So.SanFrancisco,Calif. B3 80.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 $76.00
Buffalo,N.Y. R2 76.00
Canton,O. R2 76.00
Canton,O. T4 78.00
Conshohocken,Pa. A3 73.00
Detroit,Mich. R7 79.00
Fontana,Calif. K1 90.00
Gary,Ind. U5 76.00
Houston,Tex. S5 84.00
Ind.Harbor,Ind. Y1 76.00
Johnstown,Pa. B2 76.00
Lackawanna,N.Y. B2 76.00
Los Angeles,Calif. B3 86.00
Massillon,O. R2 76.00
Midland,Pa. C18 76.00
Munhall,Pa. U5 76.00
So.Chicago,Ill. R2 U5 W11 76.00
So.Duquesne,Pa. U5 76.00
Struthers,O. Y1 76.00
Warren,O. C17 76.00

SEAMLESS TUBE (NT)
Buffalo,N.Y. R2 $85.00
Canton,O. R2 87.00
Cleveland,O. R2 85.00
Fontana,Calif. K1 105.00
Gary,Ind. U5 87.00
Massillon,O. R2 85.00
So.Chicago,Ill. R2 87.00
So.Duquesne,Pa. U5 87.00
Youngstown,O. R2 85.00
Fontana,Calif. K1 C13 $88.00

SKELP
Aliquippa,Pa. J5 $3.65
Munhall,Pa. U5 3.55
Warren,O. R2 3.55
Youngstown,O. R2 U5 3.55

WIRE RODS
Alton,Ill. L1 4.70
Alabama City,Ala. R2 4.325
Buffalo,N.Y. W12 4.625
Cleveland,O. A7 4.325
Donora,Pa. A7 4.325
Fairfield,Ala. T2 4.325
Fontana,Calif. K1 4.425
Houston,Tex. S5 4.725
Johnstown,Pa. B2 4.325
Joliet,Ill. A7 4.325
Kansas City,Mo. S5 4.665
Los Angeles,Calif. B3 4.825
Minnequa,Colo. C10 4.525
Monessen,Pa. P7 4.325
No.Tonawanda,N.Y. B11 4.325
Pittsburg,Calif. C11 4.925
Portsmouth,O. P12 4.525
Roebling,N.J. R5 4.425
So.Chicago,Ill. R2 4.325
SparrowsPoint,Md. B2 4.425
Sterling,Ill. C13 N15 4.325
Struthers,O. Y1 4.325
Torrance,Calif. C11 5.125
Worcester,Mass. A7 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 4.675
Lackawanna,N.Y. B2 4.675
Munhall,Pa. U5 4.675
So.Chicago,Ill. U5 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
Alabama City,Ala. R2 3.50
Aliquippa,Pa. J5 3.50
Bessemer,Ala. T2 3.50
Bethlehem,Pa. B2 3.60
Clairton,Pa. U5 3.50
Fairfield,Ala. T2 3.50
Fontana,Calif. K1 4.15
Gary,Ind. U5 3.50
Geneva,Utah C11 3.50
Houston,Tex. S5 4.25
Ind.Harbor,Ind. I-2 3.50
Johnstown,Pa. B2 3.60
Kansas City,Mo. S5 4.15
Lackawanna,N.Y. B2 3.60
Los Angeles,Calif. B3 4.15
Minnequa,Colo. C10 4.00
Munhall,Pa. U5 3.50
Niles,Calif.(22) P1 4.56
Phoenixville,Pa. P4 6.10
Seattle,Wash. B3 4.00
So.Chicago,Ill. U5 W11 3.50
So.SanFrancisco,Calif. B3 4.10
Torrance,Calif. C11 4.15
Weirton,W.Va. W6 4.10

Wide Flange
Bethlehem,Pa. B2 3.90
Clairton,Pa. U5 3.80
Fontana,Calif. K1 4.80
Johnstown,Pa. B2 4.00
Lackawanna,N.Y. B2 3.90
Munhall,Pa. U5 3.80
So.Chicago,Ill. U5 3.80

Alloy Stand. Shapes
Clairton,Pa. U5 4.725
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.725
Munhall,Pa. U5 4.725
So.Chicago,Ill. U5 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 3.80
Bessemer,Ala. T2 3.80
Bethlehem,Pa. B2 3.80
Clairton,Pa. U5 3.80
Fairfield,Ala. T2 3.80
Fontana,Calif. K1 6.40
Gary,Ind. U5 3.80
Geneva,Utah C11 3.80
Ind.Harbor,Ind. I-2 3.80
Ind.Harbor,Ind. Y1 6.30
Johnstown,Pa. B2 3.80
Lackawanna,N.Y. B2 3.80
Los Angeles,Calif. B3 6.30
Munhall,Pa. U5 3.80
Seattle,Wash. B3 6.30
So.Chicago,Ill. U5 3.80
So.SanFrancisco,Calif. B3 6.30
Struthers,O. Y1 6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 3.50
Bethlehem,Pa. B2 3.80
Lackawanna,N.Y. B2 3.80
Munhall,Pa. U5 3.75
So.Chicago,Ill. U5 3.60

BEARING PILES
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 5.95
Bessemer,Ala. T2 5.95
Clairton,Pa. U5 5.95
Cleveland,O. R2 5.95
Conshohocken,Pa. A3 6.20
Ecorse,Mich. G5 6.00
Fairfield,Ala. T2 5.95
Fontana,Calif.(20) K1 6.55
Gary,Ind. U5 5.95
Geneva,Utah C11 5.95
Ind.Harbor,Ind. I-2 5.95
Ind.Harbor,Ind. Y1 6.45
Johnstown,Pa. B2 5.95
Munhall,Pa. U5 5.95
Pittsburgh,Pa. J5 5.95
Seattle,Wash. B3 6.55
Sharon,Pa. S3 5.95
So.Chicago,Ill. U5 5.95
SparrowsPoint,Md. B2 5.95
Warren,O. R2 5.95
Youngstown,O. Y1 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 5.35
Coatesville,Pa. L7 5.60
Conshohocken,Pa. A3 5.50
Fontana,Calif. K1 6.20
Gary,Ind. U5 5.20
Johnstown,Pa. B2 5.20
Munhall,Pa. U5 5.20
Sharon,Pa. S3 5.20
So.Chicago,Ill. U5 5.20
SparrowsPoint,Md. B2 5.20

FLOOR PLATES
Cleveland,O. J5 4.95
Conshohocken,Pa. A3 4.95
Ind.Harbor,Ind. I-2 4.95
Munhall,Pa. U5 4.95
So.Chicago,Ill. U5 4.95

PLATES, Ingot Iron
Ashland,Ky. C15 A10 4.15
Cleveland,O. C1 R2 4.50
Warren,O. C1 R2 4.50

PLATES, Carbon Steel
Alabama City,Ala. R2 3.90
Aliquippa,Pa. J5 3.90
Ashland,Ky. C15 A10 3.90
Bessemer,Ala. T2 3.90
Clairton,Pa. U5 3.90
Claymont,Del. C22 4.35
Cleveland,O. R2 3.90
Coatesville,Pa. L7 4.35
Conshohocken,Pa. A3 4.35
Ecorse,Mich. G5 4.15
Fairfield,Ala. T2 3.90
Fontana,Calif.(30) K1 4.50
Gary,Ind. U5 3.90
Granite City,Ill. G4 4.60
Geneva,Utah C11 3.90
Harrisburg,Pa. C5 6.50
Houston,Tex. S5 4.30
Ind.Harbor,Ind. I-2, Y1 3.90
Johnstown,Pa. B2 3.90
Lackawanna,N.Y. B2 3.90
Minnequa,Colo. C10 4.70
Munhall,Pa. U5 3.90
Pittsburgh,Pa. J5 3.90
Seattle,Wash. B3 4.80
Sharon,Pa. S3 4.15
So.Chicago,Ill. U5, W11 3.90
SparrowsPoint,Md. B2 3.90
Steubenville,O. W10 3.90
Warren,O. R2 3.90
Weirton,W.Va. W6 4.20
Youngstown,O. R2, U5, Y1 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 5.65
Geneva,Utah C11 5.65

PLATES, Wrought Iron
(Add 4.2¢ to base and extras)
Economy,Pa. BH1 8.60

BARS, Hot-Rolled Carbon
Alabama City,Ala. R2 3.95
Aliquippa,Pa. J5 3.95
Alton,Ill. L1 4.40
Atlanta,Ga. A11 4.50
Bessemer,Ala. T2 3.95
Buffalo,N.Y. R2 3.95
Canton,O. R2 3.95
Clairton,Pa. U5 3.95
Cleveland,O. R2 3.95
Detroit,Mich. R7 4.10
Ecorse,Mich. G5 4.30
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.95
Fontana,Calif. K1 4.65
Gary,Ind. U5 3.95
Houston,Tex. S5 4.35
Ind.Harbor,Ind. I-2 Y1 3.95
Johnstown,Pa. B2 3.95
Kansas City,Mo. S5 4.55
Lackawanna,N.Y. B2 3.95
Los Angeles,Calif. B3 4.65
Milton,Pa. B6 4.55
Minnequa,Colo. C10 4.80
Niles,Calif. P1 4.65
N.Tonawanda,N.Y. B11 3.95
Pittsburg,Calif. C11 4.65
Pittsburgh,Pa. J5 3.95
Seattle,Wash. B3, N11 4.70
So.Chicago,Ill. R2 U5 W11 3.95
So.Duquesne,Pa. U5 3.95
So.SanFrancisco,Calif. B3 4.70
Sterling,Ill. N15 4.55
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Weirton,W.Va. W6 4.10
Youngstown,O. R2, U5 3.95

BAR SIZE ANGLES, S. Shapes
(Add 4.2¢ to base and extras)
Atlanta,Ga. A11 4.50
Niles,Calif. P1 4.65
SanFrancisco,Calif. S7 5.00

BAR SIZE ANGLES, H.R. CARBON
Bethlehem,Pa. B2 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 4.675
Buffalo,N.Y. R2 4.675
Canton,O. R2 4.675
Canton,O. T7 4.72
Clairton,Pa. U5 4.675
Detroit,Mich. R7 4.825
Ecorse,Mich. G5 5.025
Fontana,Calif. K1 5.725
Gary,Ind. U5 4.675
Houston,Tex. S5 5.025
Ind.Harbor,Ind. I-2 Y1 4.675
Johnstown,Pa. B2 4.675
Kansas City,Mo. S5 5.275
Lackawanna,N.Y. B2 4.675
Los Angeles,Calif. B3 5.725
Massillon,O. R2 4.675
Midland,Pa. C18 4.675
So.Chicago,Ill. R2 U5 W11 4.675
So.Duquesne,Pa. U5 4.675
Struthers,O. Y1 4.675
Warren,O. C17 4.675
Youngstown,O. U5 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 4.925
Gary,Ind. U5 4.925
Youngstown,O. U5 4.925

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 5.925
Bessemer,Ala. T2 5.925
Bethlehem,Pa. B2 5.925
Clairton,Pa. U5 5.925
Cleveland,O. R2 5.925
Ecorse,Mich. G5 6.025
Fairfield,Ala. T2 5.925
Fontana,Calif. K1 6.925
Gary,Ind. U5 5.925
Ind.Harbor,Ind. I-2 5.925
Indiana Harbor,Ind. Y1 6.425
Johnstown,Pa. B2 5.925
Lackawanna,N.Y. B2 5.925
Los Angeles,Calif. B3 6.625
Pittsburgh,Pa. J5 5.925
Seattle,Wash. B3 6.625
So.Duquesne,Pa. U5 5.925
So.SanFrancisco,Calif. B3 6.675
Struthers,O. Y1 6.425
Youngstown,O. U5 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W15 4.925
Beaver Falls,Pa. R2 4.925
Beaver Falls,Pa. M12 4.925
Buffalo,N.Y. B5 4.925
Camden,N.J. P11 5.325
Carnegie,Pa. C12 4.925
Chicago,Ill. R5 4.925
Chicago,Ill. W15 4.925
Cleveland,O. A7, C20 4.925
Detroit,Mich. P17, R7 4.675
Donora,Pa. A7 4.925
Elyria,O. W8 4.925
Franklin Park,Ill. N4 4.925
Gary,Ind. R2 4.925
Green Bay,Wis. R7 4.925
Hammond,Ind. I-2, M13 4.925
Hartford,Conn. R2 5.475
Los Angeles,Calif. R2 6.375
Mansfield,Mass. B6 5.475
Massillon,O. R2, R8 4.925
Monaca,Pa. S17 4.925
Newark,N.J. W15 5.475
Plymouth,Mich. P5 5.475
Pittsburgh,Pa. J5 4.925
Putnam,Conn. W15 5.475
Readville,Mass. C11 5.475
St. Louis,Mo. M5 5.50
So.Chicago,Ill. W11 4.925
Spring City,Pa. K3 5.375
Struthers,O. Y1 4.925
Waukegan,Ill. A7 4.925
Youngstown,O. R2 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W15 6.00
Beaver Falls,Pa. M12 6.00
Bethlehem,Pa. B2 6.00
Buffalo,N.Y. B5 6.00
Camden,N.J. P11 6.40
Canton,O. R2 6.00
Canton,O. T7 6.00
Carnegie,Pa. C12 6.00
Chicago,Ill. R5 6.00
Chicago,Ill. W15 6.00
Cleveland,O. A7 6.00
Cleveland,O. C20 6.00
Detroit,Mich. P17, R7 6.15
Donora,Pa. A7 6.00
Elyria,O. W8 6.00
Gary,Ind. R2 6.00
Hammond,Ind. I-2, M13 6.00
Hartford,Conn. R2 6.65
Lackawanna,N.Y. B2 6.00
Mansfield,Mass. B6 6.65
Massillon,O. R2, R8 6.00
Midland,Pa. C18 6.00
Monaca,Pa. S17 6.00
Newark,N.J. W15 6.65
Plymouth,Mich. P5 6.20
So.Chicago,Ill. R2, W11 6.00
Spring City,Pa. K3 6.20
Struthers,O. Y1 6.00
Warren,O. C17 6.00
Waukegan,Ill. A7 6.00
Worcester,Mass. A7 6.35
Youngstown,O. R2 6.00
Youngstown,O. Y1 6.00

BARS, Reinforcing (Fabricators)
Alabama City,Ala. R2 3.95
Atlanta,Ga. A11 4.50
Buffalo,N.Y. R2 3.95
Cleveland,O. R2 3.95
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.95
Fontana,Calif. K1 4.65
Gary,Ind. U5 3.95
Houston,Tex. S5 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 3.95
Kansas City,Mo. S5 4.55
Lackawanna,N.Y. B2 3.95
Los Angeles,Calif. B3 4.65
Milton,Pa. B6 4.55
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.65
Pittsburg,Calif. C11 4.65
Pittsburgh,Pa. J5 3.95
Sand Springs,Okla. S6 4.85
Seattle,Wash. N11 4.70
So.Chicago,Ill. R2 3.95
So.Duquesne,Pa. U5 3.95
So.SanFrancisco,Calif. B3 4.70
SparrowsPoint,Md. B2 3.95
Sterling,Ill. C13 N15 4.70
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Youngstown,O. R2, U5 3.95

BARS, Reinforcing (Fabricated, to consumers)
Huntington,W.Va. W7 5.50
Johnstown, 1/2" B2 5.25
Los Angeles,Calif. B3 5.45
Marion,O. P11 5.25
Seattle,Wash. N11 5.80
So.SanFrancisco,Calif. B3 5.45
SparrowsPt., 1/2" B2 5.25
Williamsport,Pa. S15 5.35

RAIL STEEL BARS
Chicago Hts.,Ill. C2 5.00
Chicago Hts.,Ill. I-2 4.75
Franklin Park,Ill. F6 5.00
Fort Worth,Tex. T4 5.10
Huntington,W.Va. W7 5.75
Marion,O. P11 4.75
Moline,Ill. R2 4.65
Tonawanda,N.Y. B12 5.00
Williamsport,Pa. S15 5.25
Williamsport,Pa. S15 5.35

BARS, Wrought Iron
(Add 4.2¢ to base and extras)
Economy,Pa. BH1 9.60
Economy,Pa. BH1 11.00
Economy,Pa. Staybolt BH1 12.20
Mck.Bks. Staybolt 13.50
Mck.Bks. N & L 9.60
Mck.Bks. R & L 11.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
Alabama City,Ala. R2 3.75
Ashland,Ky. C15 A10 3.75
Butler,Pa. A10 3.75
Cleveland,O. R2 3.75
Conshohocken,Pa. A3 4.15
Detroit,Mich. M1 4.40
Ecorse,Mich. G5 3.95
Fairfield,Ala. T2 3.75
Fontana,Calif. K1 4.75
Gary,Ind. U5 3.75
Geneva,Utah C11 3.85
Granite City,Ill. G4 4.00
Ind.Harbor,Ind. I-2, Y1 3.75
Irvin,Pa. U5 3.75
Lackawanna,N.Y. B2 3.75
Munhall,Pa. U5 3.75
Niles,O. N12 4.25
Pittsburg,Calif. C11 4.15
Pittsburgh,Pa. J5 3.75
Sharon,Pa. S3 4.15
So.Chicago,Ill. W11 3.75
SparrowsPoint,Md. B2 3.75
Steubenville,O. W10 3.75
Torrance,Calif. C11 4.15
Warren,O. R2 3.75
Weirton,W.Va. W6 3.75
West Leechburg,Pa. A1 3.95
Youngstown,O., Y1 3.75

SHEETS, H.R. (19 gage)
Alabama City,Ala. R2 3.95
Dover,O. B1 3.85
Mansfield,O. B6 3.65
Niles,O. N12 3.75
Torrance,Calif. C11 3.95

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland,O. R2 5.65
Conshohocken,Pa. A3 5.95
Ecorse,Mich. G5 6.25
Fairfield,Ala. T2 5.65
Fontana,Calif. K1 6.65
Gary,Ind. U5 5.65
Houston,Tex. S5 5.65
Ind.Harbor,Ind. I-2 5.65
Ind.Harbor,Ind. Y1 5.75
Irvin,Pa. U5 5.65
Lackawanna,N.Y. B2 5.65
Munhall,U5 5.65
Pittsburgh,Pa. J5 5.65
Sharon,Pa. S3 5.65
So.Chicago,Ill. U5 5.65
SparrowsPoint,Md. B2 5.65
Warren,O. R2 5.65
Weirton,W.Va. W6 6.05
Youngstown,O. U5 5.65
Youngstown,O. Y1 5.75

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland,O. R2 6.95
Ecorse,Mich. G5 7.45
Fontana,Calif. K1 7.85
Gary,Ind. U5 6.95
Indiana Harbor,Ind. Y1 7.05
Indiana Harbor,Ind. I-2 6.95
Irvin,Pa. U5 6.95
Lackawanna,N.Y. B2 6.95
Pittsburgh,Pa. J5 6.95
SparrowsPoint,Md. B2 6.95
Warren,O. R2 6.95
Weirton,W.Va. W6 7.25
Youngstown,O. Y1 7.05

SHEETS, Cold Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.575
GraniteCity,Ill. G4	5.275
Ind Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh,Pa. J3	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
WestLeechburg,Pa. A4	5.475
Youngstown, Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.675
Ashland,Ky.(8) A10	5.675
Canton,O. R2	5.675
Delphos,O. N16	5.675
Dover,O. R3	5.775
Fairfield,Ala. T2	5.675
Gary,Ind. U5	5.675
GraniteCity,Ill. G4	5.575
Ind Harbor,Ind. I-2	5.675
Irvin,Pa. U5	5.675
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.675
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.675
Steubenville,O. W10	5.675
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.675

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39) B2	7.775

SHEETS, Galvanneale d Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1 (43)	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J3	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.37

SHEETS, Culvert No. 16

	Cu	Cu
	Alloy	Fe
Ashland,Ky. A10	5.875	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind Harbor I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	
MartinsFy.,O.W10	5.875	
Pittsburg,Cal.C11	6.625	
SparrowsPt. B2	5.875	
Torrance,Cal.C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind Harbor,Ind. I-2	4.625
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.675
Cleveland R2	5.175
Middletown,O. A10	5.675
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TIN PLATE, American 1.25 Coke (Base Box)

	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

TIN PLATE, Electrolytic (Base Plate

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	8.80
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R (22 Ga.) COILS (Cut lengths 1/2c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W10 (cut lengths)	...	...	7.85	9.10	9.90
Brackenridge,Pa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	...	7.85	8.35	9.60 10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	...	7.85	8.35	9.60 10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom,W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	...	...	...
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	...	...	...
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.65
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta,Ill. L1	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10) S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawanna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B2	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	6.65
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.Conn.(10) S15	6.65
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.35
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.50
Middletown,O. A10	5.10
NewBritain(10) S15	5.40

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		7.65	8.25	10.20	12.50
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1			8.55	10.50	
Carnegie,Pa. S18		7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50		
Detroit D2	6.45	7.60	8.10		
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18			8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.20	7.60	8.20		
NewYork W3		7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base		7.65	8.25	10.20	12.50
Worcester,Mass.,Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.65	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T6	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)			10.30	12.50	15.35
Harrison,N.J. C18			10.30	12.50	15.35
NewYork W3			10.30*	12.50*	15.35*
Youngstown C8			10.30	12.50	15.35

* Plus $1.575 per 100 lb.

NEW CASTLE, Pa. (40) E5

NewCastle,Pa. B4	5.80
NewCastle,Pa.(40) E5	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. B2	6.45
Pawtucket,R.I.(21) N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.20
Warren,O.(40) T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40)	5.70
Youngstown Y1	5.10

STRIP, Hot-Rolled Alloy

Bridgepr,Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.,Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(32) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgepr,Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.,Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(32) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta,Ill. A11	4.45
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.45

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Kenkuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
AlabamaCity R2	6.075-6.325	
Aliquippa J5	6.075	6.525‡
Atlanta A11	6.325	6.675
Bartonville(19) K4	6.075	6.40
Buffalo W12	5.225	
Cleveland A7	6.075	6.225
CrawfordsvilleMS	6.175	6.50
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5	6.475	6.625
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	
Perth Amb.,Calif. C11	7.025	7.175
Prismith (18) P12	6.475	
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1) N15	6.075	6.425
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	
Worcester A7	6.375	6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage) (Add 4.7% on base and extras)

	Anl'd. Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(19) K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville MS	10.75	12.51
Fosturia,O. S1	10.40	13.00
Johnstown B2	10.75	12.58‡
Kokomo C16	10.625†	12.325‡
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.50
SparrowsPt. B2	10.84	12.68‡
Sterling(1) N15	10.75	12.25
Waukegan A7	10.25	11.55
Worcester A7		11.85

*Based on 14c zinc; $14.50c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.40
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fosturia,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga. I-1	5.88
No.Tonawanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	7.025
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	5.85
Cleveland A7 (43)	5.85
Crawf'sville,Ind. MS (43)	5.85
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6 (43)	6.20
Massillon,O. R8 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt.R.I. (12) NS (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7 (43)	6.15
Worcester,Mass. T6 (43)	6.50
Worcester,Mass.W12 (43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt. Md. B2 (43)	8.60
Johnstown,Pa. B2 (43)	8.50

ROPE WIRE

Alton,Ill. L1 (43)	9.15
Bartonville,Ill. K4	8.85
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester,Ja. T6 (43)	8.85

(A) Plow and Mild Plow; add 0.2c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1 (43)	6.55
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12) N6 (43)	8.05
Minnequa,Colo. C10 (43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12 (43)	6.55
Pittsburg,Calif. C11 (43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12 (43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12 (43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.575
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.575
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.575
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.575

WIRE, Fine & Weaving (8 Coils)

Alton,Ill. L1 (43)	9.20
Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawf'sville,Ind. MS (43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6 (43)	9.20

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.55

WOVEN FENCE, 9-15½ Ga.

	Col.
AlabamaCity,Ala. R2	145
Ala.City,Ala.,17-18ga. R2	222
Aliqu'pa,Pa.,9-14½ga. J5	139‡
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	139
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	166
Rankin,Pa. A7	133
So.Chicago,Ill. R2	134
Sterling,Ill.(1) N15	137

*Based on 14c zinc; $17.5c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	145
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	148
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	150
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	149
Sterling,Ill.(1) N15	146

*Based on 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	146
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh 63, Pa.	9.85

AXLES

Ind Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. AV13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	130
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt.,Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	129
Bartonville,Ill.(19) K4	126
Chicago W13	127
Crawfordsville,Ind. MS	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	145
Portsmouth,O. P12	132
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
SparrowsPt.,Md. B2	128
Sterling,Ill.(1) N15	126
Torrance,Calif. C11	146
Worcester,Mass. A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$95.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown R2	6.65

RAILS

	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675		4.25
Fairfield,Ala. T2				4.25
Gary,Ind. U5	3.775	3.675	3.725	
Huntington,W.Va. W7				5.25
Ind Harbor,Ind. I-2	3.775	3.675	3.725	
Johnstown,Pa. B2				(16)4.25
Lackawanna,N.Y. B2	3.775	3.675		4.25
Minnequa,Colo. C10	$75.50*	$73.50*		4.75
Steelton,Pa. B2	3.775	3.675		
Williamsport,Pa. S19				5.90

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
(6) Hardening	0.350
5% Cr Hot Work	0.350
Hi Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.505
18	4	2		1.65-1.66
20	2.5	4	25	1.6
12	25	3.535	3.675	
9	4	2	7	2.460
18	25	4	25	1
4.75	1	2.125		
18	4	2	5	2.44-2.45
13.5	4	3		1.6025
9	3.25	0.5		1.01

W	Cr	V	Mo	
6	4	1.5	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.820

Tool steel producers include A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H3, L3, M14, S8, T4, V2 and V3.

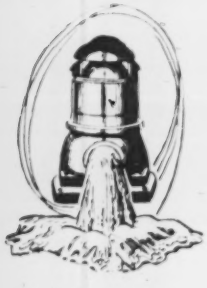
Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 5 cents lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.05c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Plate only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c ∆ for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill basis.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.85c.
(27) Bar mill sizes.
(28) Bundelized.
(29) Add $1.50 per ton.
(30) Sheared; add 0.35c for annealed mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter 60" & narrower.
(38) 14 gage & lighter 48" & narrower.
(39) 18" and narrower.
(40) Lighter than 0.05", 0.05" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N6 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Inv.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel Co.
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

WATER for Atlantic City's RITZ-CARLTON



DATA:

- WELL; Drilled by rotary clay-seal process, 850 feet deep in the Kirkwood stratum; double cased and graveled.
- CASING; 145 feet of 16" and 747 feet of 12" steel.
- SCREEN; 61 feet of 6-guage Armco Iron.
- PUMPS; Originally equipped with 4-stage 15" bowls with cast iron impellers. Later replaced with 5-stage 12" bowl and bronze impeller.
- MOTOR; Original 25 HP electric still giving good service.

ON ATLANTIC CITY's famous board walk, stands one of America's loveliest hotels—the Ritz-Carlton. Twenty-eight years ago, the owners turned to Layne for a well and pump installation. In the intervening years—over a quarter century, they have never experienced one fraction of disappointment in the dependability, durability and ever faithful performance of their purchase.

In the twenty-eight years of almost constant operation, the Layne unit has produced more than 1,471,680,000 gallons of water—all the fresh water needed by this great hotel. Upkeep expense since the day installed has averaged less than a hundred and seventy dollars a year. One amazing fact is that the original Armco iron screen is still functioning. Another is that the well was installed by a method that completely sealed off all infiltration of salt water in a most difficult salt water area. Such is the life expectancy, satisfactory operation and generally low upkeep expense of Layne wells and pumps.

For Water Well and Pump Catalogs, write to

LAYNE & BOWLER, INC.

GENERAL OFFICES, MEMPHIS 8, TENN.

Layne

There are Layne Associate Companies located throughout the country. The one near you already understands the drilling and water bearing formations in your area.

WATER WELLS
VERTICAL TURBINE PUMPS
WATER TREATMENT

BUTTWELD STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	8.5c		11.5c		17c		22c		27.5c		32c		38.5c		52c		76.5c					
Pounds Per Ft	0.85		1.13		1.68		2.25		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J2 (2)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	—	21	39.5	21.5	40	21.25	40	21.25						
Alton, Ill. I1 (1)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	—	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	—	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (1)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
Fontana, Calif. K1 (1)	21	1.75	24	5.75	26.5	9.25	27	8	27.5	10	28	10.5	28.5	10.25	28.5	10.25						
Ind. Harbor, Ind. Y1 (1)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
Lorain, O. N3 (1)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	25.25	39.5	28.75	40	26.25	40	26.25						
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown, B2 (1)	32.5	14.25	35.5	18.25	38	21.75	38.5	21.25	39	22.25	39.5	22.75	40	22.25	40	22.25						
Youngstown, Y1 (1)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9 (1)	32.5	13.25	35.5	16.25	38	18.75	38.5	18	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	5.58		8.52		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J2 (1)	24	6	27	8.25	27	8.25	28	10.25	28	10.25	33.75	15	33.75	15
Ambridge, Pa. N2 (1)	24	6	27	8.25	27	8.25	28	10.25	28	10.25	33.75	15	33.75	15
Lorain, O. N3 (1)	24	12.75	27	12.75	27	12.75	28	14.75	28	14.75	33.75	19.5	33.75	19.5
Youngstown, Y1 (1)	24	7.50	27	9.25	27	9.25	28	11.25	28	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, B2 (1)	24	6.75	27	8.75	27	8.75	28	10.75	28	10.75	33.75	15.5	33.75	15.5

BUTTWELD STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1	
List Per Ft	5.5c		6c		6c		9c		12c		$1.09	
Pounds Per Ft	0.24		0.42		0.57		0.20		10.89			
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25		
Butler, Pa. F6 (1)	30.5	1.25	25	+1.75	20	+5.5	—	—	—	—		
Etna, Pa. N2 (1)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25		
Sharon, Pa. M6 (1)	29.5	+0.25	23	+4.25	18	+8.25	—	—	—	—		
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	—	—	—	—		
Youngstown, B2 (2)	—	—	—	—	—	—	33	14.75	33	14.75		
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	—	—	—	—		

Galvanized pipe discounts based on zinc price of: (1), 14c; (2), 12.50c; (3), 14.50c; (4), 15c, with discounts adjusted depending on price of zinc at time of shipment; (**), 13c.

BOILER TUBES

Net base (1) prices, dollars per 100 ft, mill, minimum wall thickness, cut lengths 10 to 24 ft, inclusive

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71 17.77	16.20	16.20
1¼	13	16.97	19.80 21.26	16.46	19.19
1½	13	18.22 18.77	22.08 22.82	18.19	21.41
1¾	13	20.35 21.35	24.92 25.49	20.69	24.35
2	13	22.81 23.93	27.94 28.58	23.19	27.28
2¼	13	25.69 26.66	31.38 32.18	25.84	30.42
2½	12	28.40 29.36	34.55 35.58	28.46	33.50
2¾	12	31.28 32.17	37.83 39.19	31.19	36.67
3	12	33.87 34.82	40.99 42.41	33.05	38.86
3½	12	35.78 36.87	42.11 44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:

- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in. 5

- All diams. 14

Lag bolts, all diams. 34

6 in. and shorter 25

- over 6 in. long 21

Ribbed Necked Carriage 18.5

Blank 34

Plow 34

Step, Elevator, Tap and Sleigh Shoe 21

Tire Bolts 21

Boiler & Fitting-Up Bolts 31

NUTS

H.P. & C.P. Sq.	Reg. Hvy.
½-in. & smaller	15
⅝-in. & ¾-in.	12
⅞-in. & 1-in.	9
1⅛-in. & larger	7
H.P. Hex.	
½-in. & smaller	26
⅝-in. & ¾-in.	19.5
⅞-in. & 1-in.	12
1⅛-in. & larger	8.5
C.P. Hex.	
½-in. & smaller	26
⅝-in. & ¾-in.	21
⅞-in. & 1-in.	19.5
1⅛-in. & larger	12

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case of keg quantities)

	Reg. Hvy.
½-in. & smaller	35
⅝-in. & ¾-in.	29.5
⅞-in. & 1-in.	24
1⅛-in. & larger	13

	Light
⅜-in. & smaller	35
½-in. to ⅝-in.	28.5
¾-in. to 1-in.	26

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

- 1-in. diam. x 6 in. and shorter 38
- 1-in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged, per cent off list)

- No. 10 and smaller 34
- ¼-in. diam. & larger 16
- N.F. thread, all diams. 10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

- Plain finish 48 & 10
- Plated finishes 31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged, per cent off list)

6 in. or shorter:

- ⅜-in. & smaller 42
- ½-in. through 1 in. 31

Longer than 6 in.:

- ⅜-in. and smaller 26
- ½-in. through 1 in. 4

RIVETS

F.o.b. midwestern plants

Structural, ½-in., larger 7.5c

- ⅜-in. under 36 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17 to 20	60-72	17.5
8 to 16	48-60-72	17.5
7	48-60	19.5
6	48-60	20.5

CARBON

35 to 40	110	8.03
20	65 & 110	8.03
24	72 to 104	8.03
17 to 20	84-90	8.03

METALLURGICAL COKE

(Price per ton)

BEEHIVE OVENS

Connellsville fur.	$14.50-15.00
Connellsville fdy.	16.50-17.50
New River foundry	20.50
Wise county, foundry	15.50
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass. ovens	
New England del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.00
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.00
Cleveland, del.	27.41
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.35
LoneStar Tex., ovens	18.50
Philadelphia, ovens	23.50
Swedeland, Pa., ovens	23.50
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	25.85
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.50 freight zone from works.

COAL, CHEMICALS

Spot, cents per gallon, ovens

- Pure benzol 30.00-35.00
- Toluol, one deg. 30.00-33.00
- Industrial xylol 30.00-33.50

Per ton, bulk, ovens

- Sulphate of ammonia $40.45

Cents per pound, ovens

- Phenol, 40 carlots, non-returnable drums 17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF2 content 70%, $43; 60%, $40

Imported, net ton, duty paid, metallurgical grade, $43-$45

NOTE: Current prices on clad steels appeared on page 103, Jan. 12 issue.

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C R Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	44.25	40.25	34.00
304	44.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	50.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	36.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait, Types 301 347 and 430 sheets except 303 and 309 E2

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347

Bridgeville, Pa., bars, wire, sheets & strip U4

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18

Cleveland, strip A7

Detroit, strip M1 quotes 31.00c on Type 301; 36.50c 302, 38.50c; 304, 58.50c 316, 52.00c; 347, 30.50c 410, 31.00c, 430

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347

Duquesne, Pa., bars U5

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347

Gary, Ind., sheets except Type 416 U5

Harrison, N. J., strip and wire C18

Massillon, O., all items R2

McKeesport, Pa., strip, Type 410, bars & wire, Types 410 through 430 and 31 25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321 41.25c on 347 F2

McKeesport, Pa., bars, sheets except Type 416 U5

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10

Midland, sheets & strip C18

Munhall, Pa., bars U5

Muncie, Ind., wire 1-7 quotes types 302, 304, 430

Pittsburgh, sheets C18

Reading, Pa., strip except 31.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 45.25c on 309 C4

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 31.25c on Type 301 S3

So. Chicago, Ill., bars & structurals U5

Syracuse, N. Y., bars, wire & structurals C18

Titusville, Pa., bars U4

Wallingford, Conn., strip W2 quotes 0.25c higher

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J1

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c; strip 64.00c W4

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347

Waukegan, bars & wire A7

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347

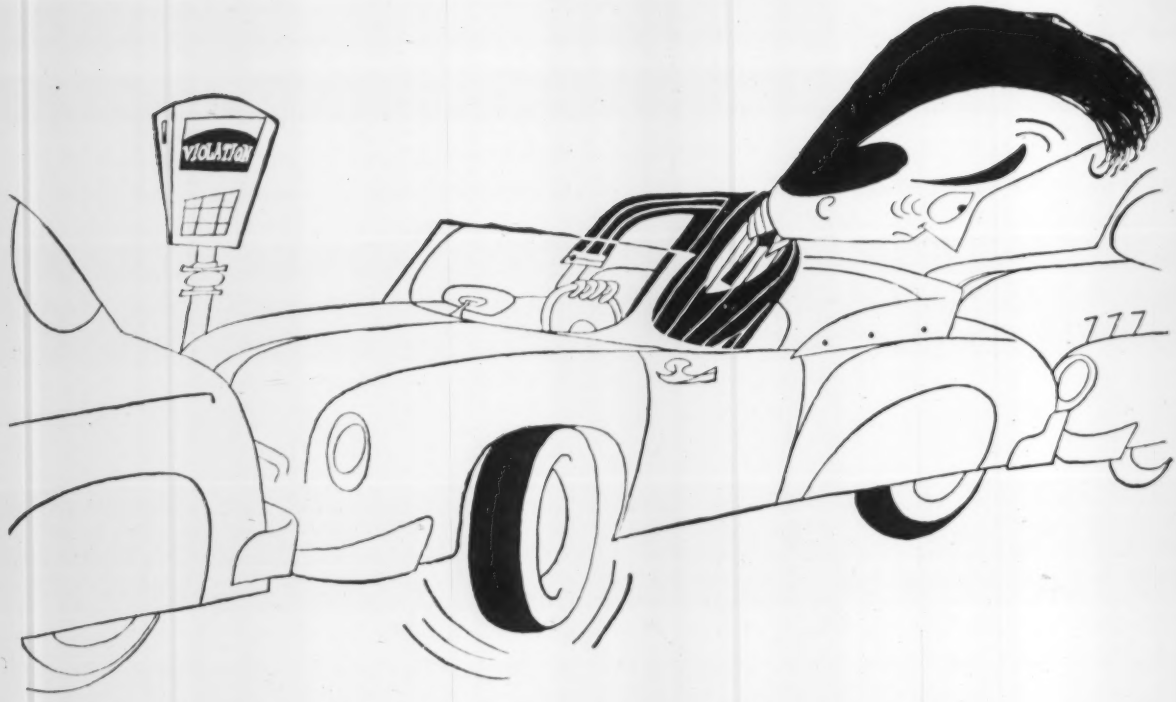
Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 31.25c on Type 301 C5

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh except as otherwise noted)

	Cents
Sponge iron:	
98.5% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N. Y. c.l., in bags	10.00
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99+% Fe	36.50
Unannealed, 99+% Fe, minus 325 mesh	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	31.00-34.25
Bronze, 10-ton lots	54.25-60.00
Phosphor Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	35.25
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 325 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel Silver 5-ton lots	46.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	82.00
Zinc, 10-ton lots	18.00-21.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum, 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

* Plus cost of metal



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Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . AISI Alloy, Max-el Machinery, Onyx Spring and Special Purpose Steels

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WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††		Carbon	Floor
New York (city)	6.56	7.57	8.72	6.86	...	6.86	7.83‡	11.34	6.69	6.90	8.31
JerseyCity(c'try)	6.35	7.27	8.47	6.75	...	6.59	7.53	9.54	6.39	6.60	8.01
Boston (city)	6.71	7.56	8.74	6.75	...	6.62	7.69‡	11.38	6.76	6.95	8.18
Boston (c'try)	6.51	7.36	8.54	6.55	...	6.42	7.49‡	11.18	6.56	6.75	7.98
Phila. (city)	6.36	7.38	8.55	6.70	8.55	6.67	7.70‡	11.04	6.42	6.40	7.62
Phila. (c'try)	6.11	7.13	8.30	6.45	8.30	6.42	7.45‡	10.79	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.57	6.62	...	6.61	7.62‡	11.37	6.67	6.67	7.90
Balt. (c'try)	5.81	7.17	8.37	6.42	...	6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...	...	6.44	8.45	...	7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.38	...	6.58	6.68	7.80
Wash. (whse)	6.31	7.61	8.90	6.80	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (whse)	6.00	6.85	8.61	6.41	...	6.10	7.15‡	11.27	6.28	6.50	7.87
Buffalo (del.)	5.80	6.65	8.41	6.21	...	5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (whse)	5.80	6.65	8.00	5.94	...	5.83	6.90‡	10.65	5.95	5.95	7.18
Detroit (whse)	6.07	6.92	8.64	6.13	7.70-8.03	6.12	7.10‡	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.34	6.20	...	6.09	7.10‡	10.90	6.48	6.32	7.71
Cleve. (whse)	5.80	6.65	8.14	6.00	...	5.89	6.90‡	10.70	6.28	6.12	7.51
Cincin. (city)	6.28	6.87	8.62	6.29	...	6.28	7.51‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.20	6.03	...	6.03	7.00‡	10.85	6.15	6.15	7.38
Chicago (whse)	5.80	6.65	8.00	5.83	...	5.83	6.80‡	10.65	5.95	5.95	7.18
Milwau. (city)	6.17	7.02	8.37	6.20	...	6.20	7.27‡	11.02	6.32	6.32	7.55
Milwau. (c'try)	5.97	6.82	8.17	6.00	...	6.00	7.07‡	10.82	6.12	6.12	7.35
St. Louis (del.)	6.30	7.14	8.50	6.34	...	6.33	7.40‡	11.15	6.55	6.55	7.78
St. L. (whse)	6.10	6.94	8.09	6.14	...	6.13	7.20‡	10.95	6.35	6.35	7.58
Birm'hm (city)	5.95	6.80	7.85‡	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birm'hm(whse)	5.80	6.65	7.70‡	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	9.80	6.95	11.40	6.80	8.80‡	12.25	6.80	6.85	9.10
L. A. (whse)	6.60	8.45	9.60	6.75	11.20	6.60	8.60‡	12.05	6.60	6.65	8.90
Seattle-Tacoma	7.37	9.17	9.85	7.27	...	7.27	9.62‡	11.90§	6.95	7.20	9.11
S. Fran.(whse)	6.90	8.20	9.60	6.75	...	6.65	8.65‡	12.05	6.50	6.75	8.90

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded); and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁴—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$29.00-$32.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00

Brazilian

44% 25:1 lump	nom.

Domestic
(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $266, f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, or Marietta, O. Base price: $227, Johnstown, Pa.; $225, Sheridan, Pa., Lynchburg, Va.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $13 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267, less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof of contained manganese over 82% and under 78% respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.50c per lb of contained Mn, carload packed 28.7c, ton lots 29.9c, less ton 31.0c. Delivered. Deduct 0.3c for max. 0.15% C grade from above prices. In for max. 0.30% C, 1.5c for max. 0.50% C and 4.5c for max. 7.5% C max. 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk 36.5c per lb of metal; packed 38.55c, ton lot 38.4c, less ton lots 40.3c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 10,000 lb or more, 39c; 2000 to 9,999 lb, 42c; 250 to 1999 lb, 44c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed 12.15c, ton lots 13.05c, less ton 14.0c. Freight allowed. For 2% C grade, Si 1.5-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 5% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2-4%). Contract, $196 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.1% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum-Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.50% max), ton lots, 2" x D, $1.75 per lb of contained Cb plus Ta, deld., less ton lots $1.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.35-0.75%). Carload packed, 1" x D, 4c per lb of alloy, ton lot 4.2c, less ton lot 4.5c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, 3" x 12" M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.0c. Deld. Spot, add 0.25c.

Graphidox No. 1: (Si 48-52%, Ca 5-7%, Ti 9-11%, C 1% max). Carload packed, 1" x D, 18c per lb of alloy, ton lots 19c, less ton lots 20.50c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%, C 1% max). Carload packed, 17c per lb of alloy, ton lots 18.50c, less ton lots 17.5c, f.o.b. Niagara Falls, freight allowed to St. Louis.

Sinanal: (Approx 20% each Si, Mn, Al, bal Fe). Lump, carload bulk 14.5c, packed 15.5c, ton lots, packed, 15.75c, less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $1 for each 1% of P above or below the base), carbide, f.o.b. seller's works, Mt. Pleasant, Sigio, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41. Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Note: For current prices on chromium, silicon, vanadium, boron and tungsten alloys see page 105, Jan. 12 issue; calcium, zirconium, briquetted alloys and refractories, page 555, Jan. 5 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 6, as amended Feb. 5, 1952

STEELMAKING SCRAP COMPOSITE

Jan. 15	$43.00
Jan. 8	43.00
Dec., 1952	43.00
Jan., 1952	43.00
Jan., 1948	40.75

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O H and Blast Furnace Grades	
2 No. 1 Bushelling	Base
3 No. 1 Heavy Melting	$1.00
4 No. 2 Heavy Melting	1.00
5 No. 2 Bundles	1.00
6 Machine Shop Turnings	10.00
7 Mixed Borings and Short Turnings	6.00
8 Shoveling Turnings	6.00
9 No. 2 Bushelling	4.00
10 Cast Iron Borings	6.00
Elec. Furnace and Fdry. Grades	
11 Billet, Bloom & Forge Crops	7.50
12 Bar Crops & Plate	5.00
13 Cast Steel	5.00
14 Punchings & Plate Scrap	2.50
15 Electric Furnace Bundles	2.00
Cut Structurals & Plate	
16 3 feet and under	3.00
17 2 feet and under	5.00
18 1 foot and under	6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under	2.00
22 Springs and Crankshafts	1.00
23 Alloy Free Turnings	3.00
24 Heavy Turnings	1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	3.00
27 No. 2 Chemical Borings	6.00
28 Wrought Iron	10.00
29 Shafting	10.00
30 Old Tc. & Terne Plated Bundles	10.00
Unprepared Grades	
When compressed constitutes	
32 No. 1 Bundles	6.00
33 No. 2 Bundles	9.00
34 Other than material suitable for hydraulic compression	8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open hearth.

(4) Premiums for Grades 11-15, 20 and 21 may be charged only when sold for use in electric and acid open hearth furnaces or foundries or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	$2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and box axles with keyways between the wheelseats	Base
5 No. 1 Bushelling	3.50
6 No. 1 Turnings	3.00
7 No. 2 Turnings, Drillings & Borings	12.00
8 No. 2 Cast Steel and uncut wheelcenters	6.00
9 Uncut Frogs, Switches	Base
10 Flues, Tubes & Pipes	8.00
11 Structural Wrought Iron and/or steel, uncut	6.00
12 Destroyed Steel Cars	8.00
13 No. 1 Sheet Scrap	9.50
14 Scrap Rails, Random Lengths	2.00
15 Rerolling Rails	7.00
Cut Rails	
16 3 feet and under	5.00
17 2 feet and under	6.00
18 18 inches and under	8.00
19 Cast Steel, No. 1	3.00
20 Uncut Tires	2.00
21 Cut Tires	5.00
Bolsters & Side Frames	
22 Uncut	Base
23 Cut	3.00
24 Angles, Splice Bars & Tie Plates	5.00
25 Solid Steel Axles	12.00
26 Steel Wheels, No. 3, oversize	Base
27 Steel Wheels, No. 3	5.00
28 Spring Steel	5.00
29 Couplers & Knuckles	5.00
30 Wrought Iron	8.00
31 Fireboxes	8.00
32 Boilers	6.00
33 No. 2 Sheet Scrap	13.00
34 Carsides, Doors, Cut Ends, cut apart	6.00
35 Unassorted Iron & Steel	6.00
36 Unprepared scrap not suitable for hydraulic compression	8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into

(4) Grade No. 2a, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6. For preparing into

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $6.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast iron:

1 No. 1 (Cupola)	$49.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	45.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	47.00
10 Malleable	55.00
11 Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission)

Birmingham

(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston

(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 bushelling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago

(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	30.50-32.50
Mixed borings, turnings	34.50-36.50
Shoveling turnings	34.50-36.50
Cast iron borings	34.50-36.50
No. 1 cupola cast	42.00-44.00
Charging box cast	40.00-42.00
Heavy breakable	37.00-39.00
Burnt cast	35.00-37.00
Cast iron brake shoes	40.00-42.00
Stove plate	41.00-43.00
Clean auto cast	44.00-46.00
Unstripped motor blocks	35.00-37.00
Malleable	46.00-48.00
Drop broken machinery	46.00-48.00

Cleveland

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit

(F.o.b. shipping point)

No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	50.00-52.00
Charging box cast	44.00-45.00

Los Angeles

(Delivered)

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	34.00
No. 2 bundles	29.00
No. 1 cupola cast	45.00
Machine shop turnings	14.00

New York

(Brokers' buying prices)

No. 2 heavy melting	35.50
Mixed borings, turnings	29.50
Machine shop turnings	25.50
Cupola cast	46.00-47.00
Unstripped motor blocks	31.00-32.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 bushelling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	45.00-46.00††
Unstripped motor blocks	38.00††
Clean auto cast	45.00††
Machinery cast	52.00††
Charging box cast	48.00

† Ceiling price. ‡ Nominal.
§ Shipping point. †† Delivered.

Pittsburgh

(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	46.00
Heavy breakable	41.00

† Ceiling price.

San Francisco

(Delivered)

No. 2 heavy melting	29.00
Machine shop turnings	14.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00

Seattle

(F.o.b. shipping point)

No. 1 bundles	29.00
No. 1 cupola cast	41.00
Heavy breakable	33.00-34.00
Unstripped motor blocks	29.00

St. Louis

(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	37.00

Youngstown

(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.

(Delivered Prices)

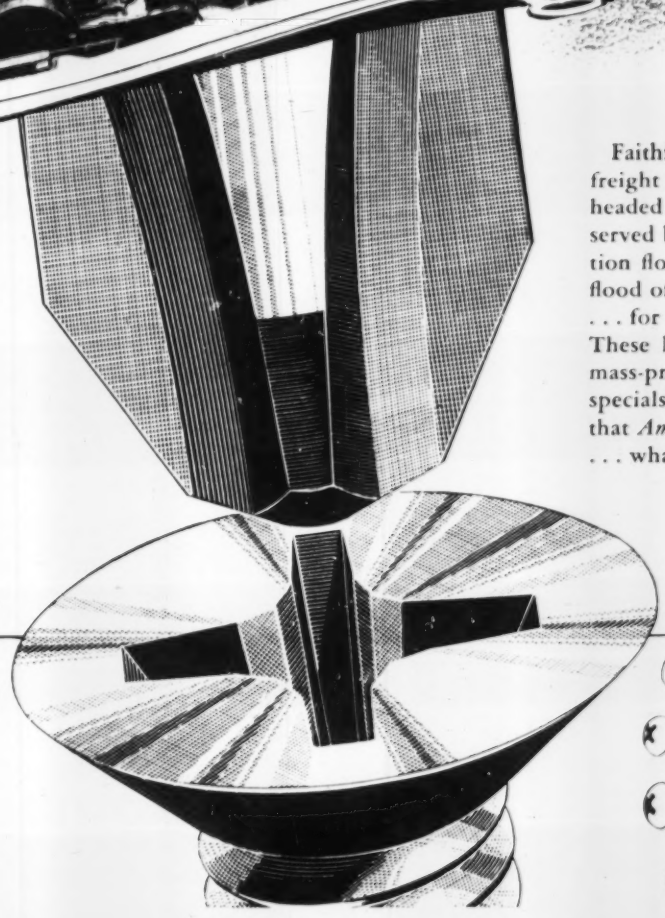
Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Bushelling	30.00
Bushelling new factory	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.o.b., shipping point.

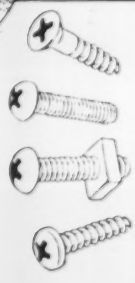
THE AMERICAN STORY

CHAPTER FIVE:

"The Faithful Freight Car"



Faithfully on schedule, every few days, a full freight car rolls out of the Willimantic plant . . . headed for just *one* of the scores of markets served by American. Here, on this 5-acre production floor, modern machines pour out a steady flood of fasteners . . . Phillips, slotted and special . . . for high-volume buyers in *all* industries. These high-speed facilities, plus experience in mass-producing threaded fasteners, standards or specials, are the reasons why you can bank on it that *American means Action* on every order. Now . . . what do *you* need, and how soon?



AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC

PRIME WESTERN

SELECT

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INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

The Metal Market

Prices are regaining importance in the metals market, indicating industry regards the days of severe shortages as a problem of the past

MARKET ACCENT in gaging metals is shifting more and more from availability to price in the new year.

That's a good indication that industry regards the days of severe shortages as fading fast. Because price levels in a free market indicate the degree of supply and demand, they will once again assume the dominant role they once enjoyed.

Demonstration Notable examples of this principle are lead and zinc, which by now are off even the government's "scarce" and "conserve" lists. Violent fluctuations were endured by these metals last year. Further adjustments will only mirror current demand-supply conditions.

Lead is again leading interference for zinc by testing the market. After stabilizing during late fall and strengthening at year end, it has undergone two successive price dips. The half-cent shaving last week resulted more from lack of buyers than from following the trend of London trading. Zinc is in a precarious position following the lead drops. Foreign prices are well below those of U. S. sellers, but fair amount of business is transacted here at average price.

Inco Did It International Nickel Co. of Canada Ltd. took the price bull by the horns after finding OPS unco-operative. It boosted the metal's price to 60 cents, f.o.b. Port Colborne, Ont., including the 1.25-cent U. S. import duty. New price was effective Jan. 14. The parent company, not its U. S. subsidiary, now sells the metal to U. S. distributors, a temporary set up that evidently gave Inco means of bypassing OPS.

American wholesale distributors can pass on the 3½-cent increase on electrolytic cathode nickel, nickel oxide sinter and other forms of primary nickel. The pass-through privilege was not given consumers though, and they may have to await a new administration's action to get relief. Consumers can now apply under the industry earnings standard GOR 10, if they are losing money; GOR 29 if essential producers of essential commodities.

Aluminum Over the Hump

Aluminum production is now over the hump. Northwest refineries will be allowed enough extra electricity to raise output by nearly 600 tons weekly because DEPA lifted a 10 per cent reduction order affecting industrial users. Heavy rains and warm weather have allowed building up water levels at hydro-plants. Unless bad breaks in weather intervene, primary output will continue upward for the rest of the year.

Interruptible power denied aluminum plants since September may be restored this week by DEPA. If so another 2800 tons of pig will be forthcoming weekly. Plants affected are Alcoa's in Vancouver and Wenatchee, Wash., Kaiser's in Spokane and Tacoma, Wash., and Reynolds' in Longview, Wash., and Troutdale, Oreg.

Improvement in the power situation led the Defense Production Administration to approve the only unsatisfied claim for second quarter 7.5 million pounds of primary aluminum for the building industry.

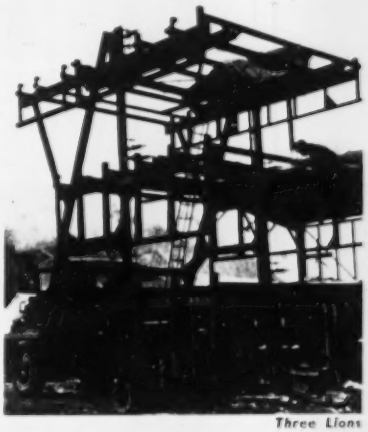
DPA warned that no early termination of aluminum distribution controls should be expected. Second-quarter allotments will continue generally on the basis of 55 per cent of base period consumption. The best that can be hoped for is supplemental allotments to take care of needy cases.

Amount of such relief will be determined by the extent to which production climbs in the Northwest and the extent to which facilities in the expansion program come into production.

Offsetting the larger production, delays in delivery of large quantities of aluminum to the national stockpile will have to be made up; imports from Canada will drop from 117-million pounds in the first quarter to 80 million in the second; repayment of the British aluminum loan will come up for settlement; and there will be a carryover of 45 days' orders from the first to the second quarter.

Foreign Silver Rises

Foreign silver last week made its first price move since July 24, advancing a half-cent to 83.75 Jan. 13. Demand for electric and electronic applications combined with strong business for sterling and silverware manufacturers and the jewelry trade to tighten the market substantially. Normally the jewelry and silverware demand is seasonal, ending before Christmas, but this year it hasn't run true to form. Less foreign ore has been offered for smelting in this country and supplies are short. U. S. Treasury's buying and selling prices of 90.5 and 91 cents respectively are unchanged.



Three Lions

Jumbo for Kitimat

Welders add the finishing touches to "Jumbo" a scaffold for the Kitimat aluminum smelter project in British Columbia. It will mount batteries of drills for digging two ten-mile tunnels to bring water from the Nechako River to a power station on Kemano Bay

Business Boom for Wire Mills

Booming business in nearly all segments of industry is helping balance orders of copper wire mills more evenly. New power capacity installed in 1952 amounted to 86-million kwh and additions aren't through by a long shot. Deliveries of heavy high voltage power cables used by utilities now run four to six months. Building wire materials in small sizes are readily available, though sales are beginning to pick up with construction prospects. Open space once existed on order books for magnet wire in fine sizes such as that used for television receivers. Now all segments are pretty well filled. Square and rectangular wire requires about 60-day lead time, primarily because it's used on production lines. Wire wholesalers are carrying light inventories, but can fill it quickly enough from mills if spot demands arise. ACSR is plentiful because of the number of people making it, and because restrictions on inventories and new building projects dampen demand.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 12.50c; brass special 12.75c; intermediate 13.00c; East St. Louis; high grade 13.50c delivered.

Lead: Common 13.80c; chemical 13.90c; corroding 14.00c; St. Louis.

Primary Aluminum: 99% plus, ingots 20.00c; pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 18.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American (99.90-99.8% and over but not meeting specifications below 34.50c; 99.8% and over, arsenic 0.06% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs 62.00c; XX nickel shot 63.00c; F nickel rod or ingots, for addition to cast iron 66.00c. Prices include import duty.

Mercury: Open market, spot, New York, $217-$220 nominal, per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.50 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $1.75-$2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (keg-s), $2.42 per lb for 100 lb (case-s), $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 84.2c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 46.52; yellow brass 40.17; commercial bronze, 95% 45.15; 90% 44.38; red brass, 85% 43.10; 80% 42.34; best quality, 41.35; nickel silver 18% 55.08; phosphor-bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37; cold-drawn 42.62; yellow brass free cutting 33.85; commercial bronze 95% 41.81, 90% 41.07, red brass 85% 42.79, 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze, 90% 47.01, red brass, 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze, 95% 45.41, 90% 41.67; red brass, 85% 43.39, 80% 42.63; best quality brass, 41.61.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb. lots, 32.75; 30,000 lb lots, 32.92; l.c.l., 33.42. Weatherproof, 100,000 lb, 33.60; 30,000 lb, 33.85c; l.c.l., 34.35. Magnet wire del., 1,000 lb or more, 38.75; l.c.l., 39.50.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish; c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base†	Coiled Sheet Circle† Base
0.249-0.136	12-48	31.6	....	....
0.135-0.096	12-48	32.1	....	....
0.095-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5‡	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. or Distance across flats	Round — R317-T4	Round — R317-T4	Hexagonal 178-T4	Hexagonal 178-T4
0.125	54.6	....	....	....
0.156-0.6188	46.2	....	....	....
0.219-0.313	43.6	....	....	....
0.375	42.0	48.3	50.4	....
0.406	42.0	....	....	....
0.438	42.0	48.3	50.4	....
0.469	42.0	....	....	....
0.500	42.0	48.3	50.4	....
0.531	42.0	....	....	....
0.563	42.0	....	47.3	....
0.594	42.0	....	....	....
0.625	42.0	45.7	47.3	....
0.688	42.0	....	47.3	....
0.750-1.000	41.0	43.1	44.6	....
1.063	41.0	....	43.1	....
1.125-1.500	39.4	41.5	43.1	....
1.563	38.5	....	....	....
1.625	38.3	....	41.5	....
1.688-2.000	38.3	....	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets: Full rolls, 100 sq ft or more $15.00 per cwt; add 50c cwt for 90 to 100 sq ft. Pipe: Full coils $15.00 per cwt. Traps and bends: List prices plus 45%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 20.00-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 21.25-21.75c; over 12-in., 21.25-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Dec. 15, 1952) Sheets, cold-rolled 79.50c. Strip, cold-rolled 75.50c. Rods and shapes 75.50c. Plates, 77.50c. Seamless tubes, 105.50c.

MONEL

(Base prices f.o.b. mill, effective Dec. 15, 1952) Sheets, cold-rolled 63.00c. Strip, cold-rolled 66.00c. Rods and shapes, 61.00c. Plates, 62.00c. Seamless tubes, 96.00c. Shot and blocks, 54.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 2,000 lb, 55.00-62.00c; 2,000 to 20,000 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed. Flat, rolled 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carload, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb 78.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.5c; 100 or 300 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c; 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 78.5c; 100 lb kegs 80.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	19.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 50,000 lbs)

Segregated plant scrap; 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 10.75; batters plates 5.00; linotype and stereotype 12.50; electrotype 10.75; mixed babbitt 13.75.

Zinc: Old zinc 5.50; new die cast scrap, 5.50; old die cast scrap, 4.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Jan. 14-15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 7-11	24.50	14.30	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 2-6	24.50	14.55	13.00	121.50	20.00	34.50	56.50	83.25
1952								
Dec. Avg.	24.50	13.925	12.50	121.50	20.00	34.50	56.50	83.25
Nov. Avg.	24.50	13.965	12.50	121.50	20.00	34.688	56.50	83.25
Oct. Avg.	24.50	14.226	13.259	121.50	20.00	35.00	56.50	83.25
Sept. Avg.	24.50	15.80	13.99	121.50	20.00	35.00	56.50	83.25
Aug. Avg.	24.50	15.80	14.067	121.50	19.923	35.00	56.50	83.25
July Avg.	24.50	15.80	15.00	121.50	19.00	35.00	56.50	82.885
June Avg.	24.50	15.06	15.74	121.50	19.00	35.00	56.50	82.75
Jan. 1952 Avg.	24.50	18.80	16.50	109.404	19.00	50.00	56.50	88.00
Jan. 1948 Avg.	21.50	14.825	11.056	94.00	15.00	33.00	33.75	74.625

NOTE: Copper: Electrolytic del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits del. New York; Aluminum primary ingots, 99% del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

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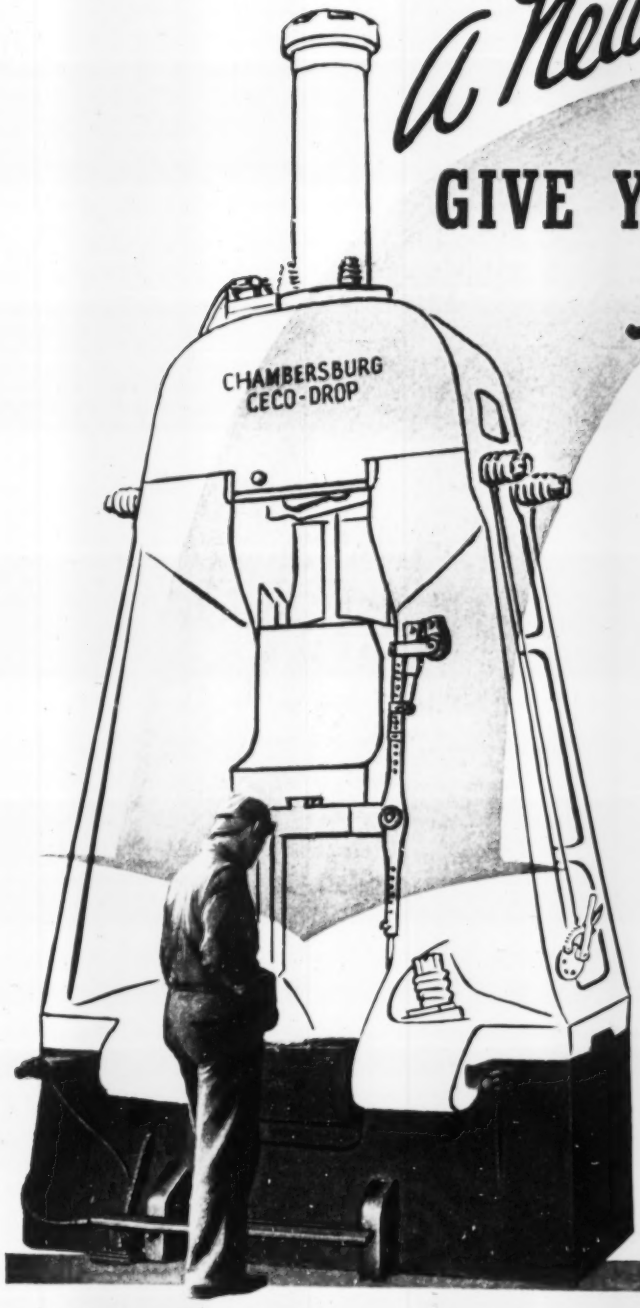

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CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

Semifinished Steel . . .

Semifinished Prices, Page 121

Pittsburgh—At present, open space exists on mill books for May delivery of forging quality billets in alloy materials. Mills are not currently offering any hope of an easing in the situation for their customers. Yet, six weeks ago they urged forgers to get in orders immediately for any material they expected to need for April delivery. High-alloy forging steel is the most difficult to get, and the lesser grades aren't much easier to obtain.

Youngstown—U. S. Steel Corp.'s Youngstown open-hearth works hung up in December what is believed to be a new industry wide open-hearth steel speed record. The 15 furnaces made average heat times, tap to tap, of eight hours and 57 minutes. This shattered the previous record of nine hours and four minutes, also held by the Ohio Works open-hearth plant.

Generally the time is 10 to 11 hours, tap to tap, although higher speeds have been made through duplexing.

Sheets, Strip . . .

Sheet and Strip Prices, Page 121 & 122

Chicago—Customer quotas on hot, cold-rolled and galvanized sheets for second quarter are about the same as first quarter and are being taken up fully. Carryover from 1952 was about 3 weeks and is expected to be about the same at end of first quarter. On hot-rolled sheets, set-asides are completely occupied. One maker regards 60 per cent of its hot-rolled sheet bookings in the "must" category; 30 per cent of its cold rolled. Considerable conversion business is being declined.

Boston—Relief in sheet shortages is expected first in galvanized. Demand for carbon grades continues heavy. More tonnage will be available in second quarter, but demand is correspondingly strong. Notably tight are hot-rolled carbon sheets in heavier gages for household fuel tanks. Narrow cold strip bookings for second quarter are less feverish than for sheets.

New York—Demand for sheets, especially cold rolled, continues at a high level. Manufacturers of vending machines, switch boxes, lockers, kitchen cabinets and stoves are pressing for tonnage. Manufacturers of refrigerators, deep freeze equipment and washing machines are active.

Philadelphia—The leading producer has been forced virtually to blank out April on hot and cold sheets for commercial consumers and has not yet opened books for May. Most mills have been able to enter little new non-defense tonnage in these grades for April because of prospective carryovers and required set-asides. Many doubt if they will be able to meet all requirements for the second quarter. Alan Wood Steel Co., Conshohocken, Pa., expects to have a new continuous pickling line in operation in September.

Pittsburgh—Demand for steel sheet and strip remains strong with no signs of slackening. Order books for second quarter will be filled soon. No real effect on the sheet and strip market in the first half is expected from the increased steel ingot capacity; the real story will begin to unfold in February and March when books are opened for third quarter.

St. Louis—Second quarter books on sheet steel have been opened by Granite City Steel Co. Customers will get about the same tonnage they were allotted the last two quarters. May and June orders are coming in with a speed indicating no decline in this district's consumer demand.

Birmingham—Prospects for some additional tonnage of cold rolled sheets are reasonably good, but there is nothing to indicate any substantial increase in availability of the product since demand in this territory has not slackened appreciably.

Los Angeles—No new flat-rolled tonnage, except cold-rolled strip, could be accommodated in first quarter by district sheetmakers engaged in working off carryover.

Plates . . .

Plate Prices, Page 121

New York—Inquiry for sheared and universal plates still exceeds supply. Producers are booked solidly as far ahead as they care to promise delivery. Barring one or two notable exceptions, producers have not opened their books for non-defense work beyond April; they have not been able to accept much new tonnage for even that period because of anticipated carryovers and set-asides for military, warehouse and conversion requirements. One leading producer says his facilities are already fully booked for the entire second quarter.

Car builders have been allotted more tonnage by Washington for the second quarter, not only plates but bars and shapes as well; however, there is serious doubt in the minds of some steel producers that car-builders will be able to obtain enough steel to meet the goal of 9000 cars per month.

Boston—Consumers and producers are skeptical as to any easing in the near future on plates, except on light and narrow sizes. Mills scheduling on a monthly basis are filled for April; others are extended deeper into the second quarter. While over-all demand for carbon plates is steady, demand is growing for specialties, including clad, lined and low alloys.

Philadelphia—Fabricating shops are making little headway in building up inventories. They are making no definite predictions as to when an easing will develop. Some mills were forced to withdraw shortly after opening April books.

Pittsburgh—Steel plates remain in great demand. Some requests for second quarter allotments are as much as 150 per cent higher than in the previous quarter.

Chicago—A platemaker who gave his customers no quotas for this product for first quarter has set up quotas for second quarter, but the tonnages are only about 50 per cent of those of third quarter last year.

Birmingham—A tight market for plates is expected through the second quarter on the basis of current and prospective demands.

Seattle—Plate fabricators' supply situation has not improved. Mills which were indicating first quarter deliveries are now advising buyers second quarter is the best they can promise.

Tubular Goods . . .

Tubular Goods Prices, Page 125

Philadelphia—Demand for large diameter fabricated pipe has eased, reflecting completion of some of the major lines. Further new programs are being developed, and pipe fabricators expect a spurt in demand from Canada soon.

Pittsburgh—Biggest hue and cry comes from oil country customers who find their stocks low and no substantial replenishment in sight. Butt-weld pipe inventories are fair tonnagewise, but are unbalanced. Tonnage on hand is good, but not in the sizes in greatest demand. Weak spot is in the smaller sizes. Mechanical pressure and stainless tubing are extremely tight and the difficulty stems from the lack of alloys.

Los Angeles—Tubular goods are moving freely to pipe distributors under M-6, but only small tonnages are available to other interests. Supply of tubular goods is easier than in most other steel products.

San Francisco—Buttweld pipe in sizes from ⅛ in. to 2 in. is in "very good supply." This is attributed to greater production rather than to slower demand. In sizes 4 in. to 24 in. demand is growing faster than mills can produce.

Seattle—Cast iron pipe market is more active, but is not expected to reach seasonal heights for 30 days when cities place requirements for inventory and planned expansions.

Steel Bars . . .

Bar Prices, Page 121

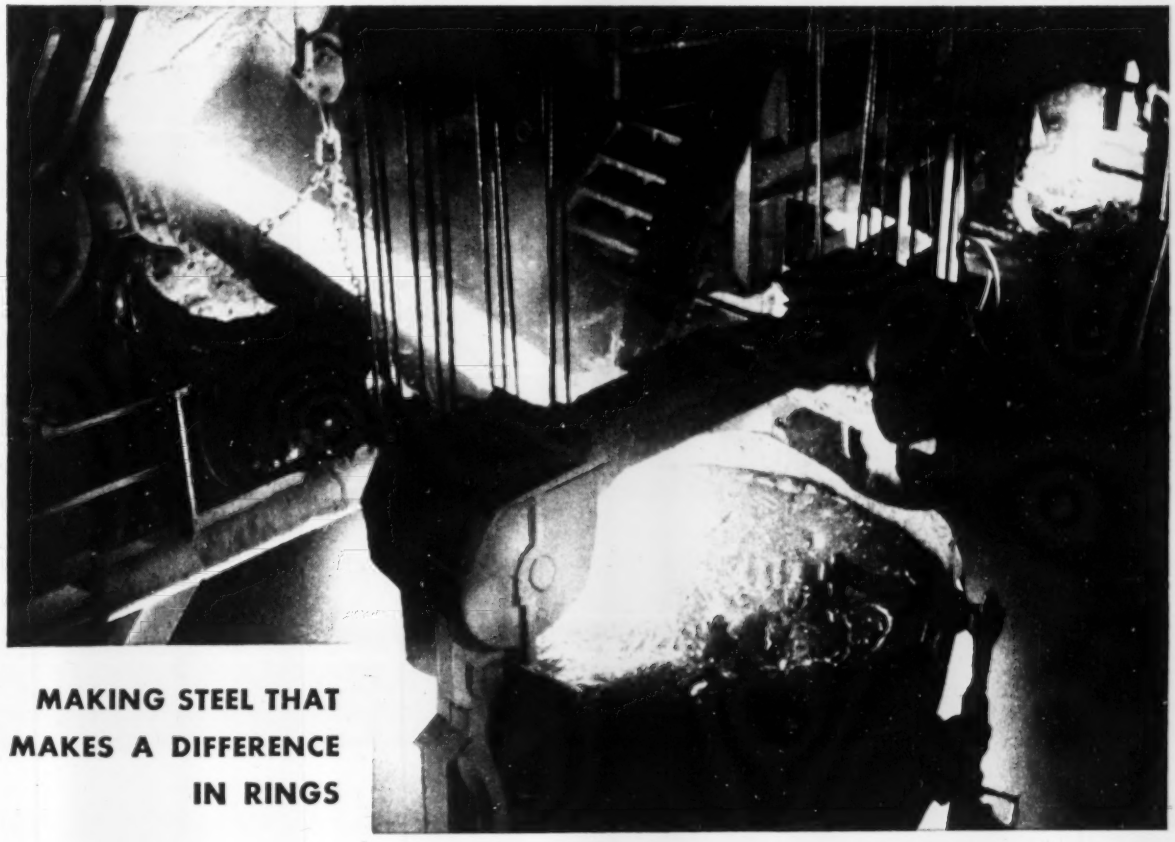
Boston—Considering the relatively good job done by converters in meeting cold-finished bar requirements under controls which assured them monthly allotments of hot-rolled bars, some question arises as to their ability to maintain this supply when controls are dropped. For the most part, converters furnish stock 2 in. and under. While they are not solving the carbon and alloy bar shortages, they are helping. Except in sizes under 1 in., little additional carbon bar tonnage is forthcoming from the mills.

New York—A large number of first quarter tickets held by non-defense consumers of hot carbon bars will not be filled. Most bar producers have only March in which to handle first quarter tickets, which are not extendable. There will be a substantial carryover into the second quarter.

Philadelphia—Except for some small sizes, particularly in cold drawn, pressure for carbon bars remains strong. Mills are still falling behind on commitments and most of them will have heavy carryovers at the end of the quarter.

Pittsburgh—Books are pretty well filled for the second quarter on hot-rolled steel bars, and they are expected to be in tight supply through that period. While J.&L.'s new bar mill is augmenting supply, it is not expected to bring about any great easing before the third quarter. Its principal output will be in smaller diameters.

Chicago—The military is acquiring more lead-bearing bar steel for its fuze program and insists this tonnage is not included in prescribed set-



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asides. This causes some schedule disruption.

Los Angeles — Large-sized cold-finished bars are tight, small size rounds and flats, easier. Demand has eased for small diameter hot-rolled bars and some distributors are not taking their allotments in this product.

Wire . . .

Wire Prices, Page 124

Pittsburgh — Demand for manufacturers wire products continues strong and is expected to remain so through the second quarter of this year. Mainspring of this demand is the automotive industry. Furniture and bedding manufacturers are making a strong bid for high carbon wire. Merchant wire products, especially nails, barbed and fence wire are comparatively easy.

Birmingham — Most distributors report a seasonal easing in agricultural demand for wire. Most users of manufacturers wire are being taken care of satisfactorily.

Tin Plate . . .

Tin Plate Prices, Page 122

Washington — Second quarter export quota on production tin plate for food and petroleum packaging abroad will be 138,000 short tons, the Office of International Trade, Commerce Department, announced last week. Of this total, 118,035 tons are for food packaging and 19,965 tons for petroleum packaging. The first quarter quota was 118,875 tons, 97,500 being for food and 21,375 tons for petroleum packaging. The second quarter increase reflects continuing improvement in domestic supply. The 118,035 tons licensed for food packaging will be distributed among 49 countries.

Los Angeles — Entire 1953 output of Kaiser Steel Corp.'s Fontana Works tin plate mill has been taken by major tin can manufacturers.

Structural Shapes . . .

Structural Shape Prices, Page 121

New York — Public work, bridges in particular, still dominates the structural market. Featuring inquiry are 9000 tons of approach work for the New York state thruway bridge across the Hudson, off Rockland county. Plans for this bridge are being redesigned to require about 54,000 tons, compared with earlier estimates of 60,000 to 65,000 tons. No bids were received on the original opening.

Boston — District shops are buying more foreign structurals at a price close to 5.00c a pound, net, Boston dock. Where direct arrangements have been made with foreign mills, substantially lower prices are reported. Allotments of domestic structurals to some fabricators were halved for March, stimulating buying of foreign material.

Philadelphia — Structural activity is supported principally by bridge work and various government defense projects. Ban on some types of commercial construction is being eased.

Pittsburgh — Structural steel books are filling rapidly, but mainly for

construction already in progress. Certain civic, legal matters have held up awarding of the San Rafael bridge contract which will require about 10,000 tons of structurals.

Chicago—Mill commitments don't reflect any easing in structural demand. One shape maker, who gave no first quarter quotas to customers because of overwhelming carryover, has set up second quarter quotas. Allowances, however, are only about half of those given in third quarter 1952.

Seattle—Fabricating plants are in comfortable position, except as to supply of some items, principally wide flange sections and plates.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 121

Seattle—Except for a 10 per cent power restriction, rolling mills are again at capacity operation following the holidays. Backlogs are higher than normal and prospects for the next six months are excellent.

Pig Iron . . .

Pig Iron Prices, Page 120

Philadelphia—Foundry iron continues in ample supply because consumers are operating on a limited basis. Basic iron is tight. A cargo of iron enroute from Australia is being diverted by United States Steel from New England to Philadelphia for rail shipment to Morrisville, Pa. The Nancy furnace is down for repairs at that plant. Cargo contains an estimated 8000 tons and is a part of some 30,000 tons placed by the firm some time ago. One cargo was received at Providence, R. I., recently.

New York—Pig iron supply remains slightly in excess of requirements. District gray iron foundries have increased operations, although certainly no higher than the limited rate prior to the year-end holidays. The immediate outlook is for no important improvement.

Buffalo—With automotive and building equipment casters calling for substantial tonnages, merchant pig iron producers have no trouble selling their current output. Some of the smaller jobbing foundries still are working on a curtailed basis.

Pittsburgh—Pig iron demand is active, some being extra-territorial. Several steel companies are adding to this demand by placing open market orders for iron to replace tonnages lost while some of their furnaces are down for repairs. Foundry demand continues low.

Youngstown—U. S. Steel Corp. plans to blow out its No. 4 blast furnace at its Ohio Works here Feb. 15 for about 20 or 21 days. This will be the first important change in iron or steel production here for any week since early last fall.

Chicago—Foundry pig iron is in the closest supply-demand balance achieved in the last 12 months. Thus, the current pickup in gray iron castings orders isn't likely to create any serious tension in the next few weeks.

St. Louis—Granite City Steel Co. converted one of its two blast furnaces to foundry pig iron production to supply consumers whose reserves had become depleted during both stacks' two-month devotion to basic. Although melters are still on quota,

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most of the pressure is gone from demand.

Birmingham Virtually all the district's melt of pig iron is still going into the surrounding territory.

Fontana, Calif. Kaiser Steel Corp. turned out 977,267 tons of pig iron in 1952, as against 921,752 tons in 1951. December was a peak month, accounting for 91,165 tons. With a third blast furnace scheduled for initial operations in the spring, the company's capacity will be raised to 1,314,000 tons a year.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 125

Washington An industry earnings standard increase in prices of beehive oven coke averaging 6 per cent was authorized last week by the Office of Price Stabilization. The increase, provided in amendment 15 to SR 13, general ceiling price regulation, effective Jan. 12, is based on the industry's sales during the 12 months ending Apr. 30, 1952.

As in the case of ceiling price relief granted producers of by-product oven coke, producers of beehive coke are permitted to increase ceiling prices of the different grades by varying amounts. The increases, however, may not total more than 6 per cent of sales in the year ended Apr. 30, 1952, and no one ceiling price may be increased more than 10 per cent. Beehive coke production in 1952 was valued at an estimated $65 million, comparing with $100 million in 1951.

Chicago Demand for foundry coke is increasing. Gray iron castings business is picking up noticeably and producers find they had let their yearend coke inventories drop to lower levels than they had realized.

Warehouse . . .

Warehouse Prices, Page 127

New York While warehouses could sell more sheets and tubular products, there are signs of slight easing in demand. Distributors have a better inventory balance and they are gradually replenishing stocks to pre-strike levels. Bolts, nuts and nails are slow; prices are soft on the latter. Alloys and specialties are more easily available; inquiries from normal mill buyers are slackening since their receipts from mills are improving. Foreign steel in standard carbon grades is offered in larger quantities at lower prices.

Boston With few products excepted, notably hot and cold-rolled sheets, pressure for steel from warehouses is easing slightly. First apparent in tool steel and other specialties, it now applies to additional steel products.

Philadelphia Warehouses report active demand and most of them look for January business to exceed that of December, which was the best for that month in recent years. Only in galvanized sheets and small cold-drawn bars does demand appear to be lagging.

Pittsburgh Warehouses report continued heavy demand from customers. Stocks, on the other hand, are still sorely out of balance. Warehousemen report that the present situation is no better than it has ever been. In addition to heavier material, lighter plates and smaller sizes of cold-finished bars are in big demand and short supply.

Los Angeles Warehouse sales are sustained at the December level, a month of high activity. With inquiries more numerous and with inventories approaching 75 per cent of normal, distributors describe warehouse conditions as "healthy."

Scrap . . .

Scrap Prices, Page 128

Detroit The Detroit market for open-hearth, electric furnace and blast furnace grades of scrap continues at ceiling levels. Strong demand is reported. Sales of blast furnace material were made to Ford last week. Cast scrap, however, continues easy and is moving sluggishly at below ceiling prices. The movement of this material is restricted but there is no panicky selling.

Chicago Scrap is no deterrent to all-out steel production. Mill inventories are in the neighborhood of 60 days. Receipts are substantial. Dealers' inventories of steelmaking grades are low. Bad weather can't impose any crippling obstacle between now and spring. Foundry operations are improving but cast scrap continues in the doldrums. Prices are depressed several dollars a ton.

New York A firmer trend has developed in No. 1 cupola cast. At least one leading consumer made an effort to do better than the $45 delivered price without success, finally placing more tonnage at that level. Heavy breakable cast, on the other hand, continues easy, with the Phoenixville, Pa., consumer withdrawing from the market. Steel scrap prices remain firm.

Buffalo Sharp decrease in dealers' receipts of scrap is forcing mills to draw from reserve stocks to maintain current capacity operations. Cast continues weak with small sales reported at unchanged prices.

Philadelphia An outside broker is offering $45, f.o.b. Philadelphia, for charging box cast and a few carloads have been purchased at this level. This is equivalent to around $48 delivered. The market otherwise is unchanged, with all steel grades holding at ceiling and most cast grades moving at less than ceiling.

Pittsburgh Mills' scrap inventories are high. The market is characterized by two extremes: Demand is active for low-phos grades and railroad specialties; slow for run-of-the-mill items. The only activity among cast grades centers around machinery cast. Prices are lower on No. 1 cupola cast at $46 and on heavy breakable at $43.

St. Louis Following a heartening pickup in scrap shipments to this district, bad weather forced the local market back into the doldrums. No significant buying is reported, largely because brokers can't fill all old orders. Mills are taking all the open-hearth grades they can get, but receipts are less than daily melt. Earlier open weather had given them an average stockpile of 60-days, so they are far less concerned than brokers about tight shipments. Dealers' yards are practically bare.

Birmingham — Moderate pick-up in scrap activity is evident here with the district's biggest user back in the market for moderate tonnage in carlots or larger. Some melting steel continues to go to the Georgia producer, but bulk of the tonnage is moving out of the district, largely by barge. Not a great deal of buying is evident in cast grades with the exception of cupola cast which is moving at $44-$45.

Los Angeles With demand for foundry scrap weaker, prices of No. 1 cupola cast fell $1 to $45. Movement of steelmaking scrap is steady but mill interest is weakening.

Seattle The bearish influence of large stocks of scrap in California is reflected in the local market where heavy melting is now being bought at $2 to $3 under ceiling. Good material is arriving at tidewater in satisfactory volume, although inventories are not rising rapidly. Bundles and motor blocks are quoted at $29.

Foundry To Be "Mothballed"

Pittsburg, Calif. — A government foundry here, operated by Columbia-Geneva Steel Division, U. S. Steel Corp., and presently undergoing restoration and rearrangement for the production of armor steel hull castings will be placed in "mothballs" after its rehabilitation, says the San Francisco Ordnance District.

Columbia-Geneva will continue to operate the foundry's two open hearths on a tonnage rental contract with the government.

The program of rehabilitation, begun under Columbia-Geneva's direction in August, 1952, will be continued. Upon completion, that part of the foundry equipped for the production of armor castings will be placed in a standby position for future utilization in case of an emergency requirement.

The decision to hold the plant in reserve instead of operating it immediately following completion of the installation of $9.5 million added equipment follows announcement of a cut-back in tank and automotive defense items by the Department of Defense.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

18,000 tons, power plant, Madison, Ind., for American Gas & Electric Service Corp., Cincinnati, to Mississippi Valley Structural Steel Co., Decatur, Ill.

13,000 tons, power house, Cheshire, O., for American Gas & Electric Service Corp., Cincinnati, to American Bridge Co., Pittsburgh.

970 tons, medical center buildings, Camp Detrick, Md., through Ajax Construction Co., general contractor, to unnamed fabricator.

950 tons, maintenance-traffic depot and laboratory, State Department of Public Works, Route 9, Wellesley, Mass., Carter Construction Co., Boston, low.

740 tons, warehouse and office building, 316 W. 31st St., New York, through Gotham Construction Co., that city, general contractor, to Sherry & Gordon Inc., Bronx, New York.

500 tons, state bridge, Vernon-Tolland, Conn., to Bethlehem Steel Co.; M. A. Gammino Construction Co., Providence, R. I., general contractor; also 165 tons, steel piling to same fabricator.

550 tons, pier shed, Fall River, Mass., to

Haarmann Structural Steel Co., Holyoke, Mass., through Carlson Construction Co., Watertown, Mass.

480 tons, sludge disposal structures, sewage treatment plant, Washington, to Barber & Ross, that city; Charles H. Tompkins Co., Washington, general contractor.

350 tons, three-span continuous deck plate girder bridge, Deerfield river, Readsboro, Vt., to Phoenix Bridge Co., Phoenixville, Pa., through W. H. Morse Construction & Lumber Co., Bennington, Vt., general contractor.

295 tons, state bridge, Green county, New York, through Savin Construction Co., to Phoenix Bridge Co., Phoenixville, Pa.

270 tons, science and art building, Marymount College, Tarrytown, N. Y., through Skinner & Cook Inc., general contractor, to Grand Iron Works, Bronx, New York.

230 tons, maintenance hangar and service building, airport, Burlington, Vt., to Vermont Structural Steel Corp., Burlington; Davison Construction Co., Manchester, N. H., general contractor.

200 tons, test laboratory, naval shipyard Portsmouth, N. H., to Groisser & Shiager Iron Works, Somerville, Mass.; Farina Bros. Co., Newton, Mass., general contractor.

135 tons, buildings and facilities, Chemical Corps training command, Fort MacCleland, Ala., to Sherwood Moore Iron Works, Montgomery, Ala.; Shelby Construction Co., New Orleans, general contractor.

135 tons, Junior High School No. 26, Queens, New York, through Psaty & Furman Inc., general contractor, to Simond Holland, Brooklyn, N. Y.

115 tons, state highway bridge, Lincoln, R. I., to Phoenix Bridge Co., Phoenixville, Pa., through M. A. Gammino Co., Providence, R. I., general contractor.

105 tons, county bridge, Ulster county, New York, through Fred W. Johnson Co., to Pine Brook Iron Works, Scranton, Pa.

100 tons or more, medical school and teaching hospital, University of Mississippi, Jackson, Miss., to Hawkins Iron Co., Birmingham; Farnsworth & Chambers Construction Co., Houston, Tex., general contractor.

100 tons or more, operations, garage and supply building, naval air station, Oceana, Va., to Globe Iron Construction Co., Norfolk, Va.; Virginia Engineering Co., Inc., Newport News, Va., general contractor.

STRUCTURAL STEEL PENDING

9000 tons, approach work, Hudson river bridge, off Rockland county, New York state thruway, bids Jan. 29; plans for bridge are being redesigned with the probability that the project will require around 54,000 tons of structural steel, including approach now being advertised.

8700 tons, superstructure, twin bridges, Cuyahoga river, Summit county, Ohio; bids Jan. 14, Ohio Turnpike Commission, Columbus, O.

6000 tons, including 4100 tons silicon or low alloy steel, bridge superstructure, Missouri river, at the Paseo, Kansas City, Mo.; also 160 tons castings, and 350 tons, cables and suspenders; bids in.

3500 tons, hangar, Army Corps of Engineers, McGuire Field, Wrightstown, N. J., to T. C. Batson Construction Co., Dallas.

3500 tons, 9-story basic science building, state medical center, Brooklyn, N. Y.; bids asked.

3225 tons, superstructure, twin bridges over Maumee river, Ohio turnpike, Lucas and Wood counties, Ohio; bids Jan. 21, Columbus, O.

3170 tons, hangar, Army Corps of Engineers, Roswell, N. Mex.; bids closed Jan. 13.

2929 tons, hangar, Army Corps of Engineers, El Paso, Tex.; bids closed Jan. 6.

2800 tons, steel transmission towers, Tennessee Valley Authority, Washington.

2247 tons, hangar, Army Corps of Engineers, Bossier Parish, La.; bids closed Jan. 15.

1500 tons (some galvanized), Corps of Engineers, Pittsburgh.

1200 tons, five bridges, Amesbury-Salisbury, Mass.; bids Feb. 3, state Department of Public Works, Boston.

625 tons, five bridges, Mahoning county, Ohio; bids in to Ohio Turnpike Commission, Columbus, O.

263 tons, Garden State parkway, section 7, contract 14, Middlesex county, New Jersey, general contractors' bids Jan. 26, the steel to be furnished by the New Jersey Highway

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210 tons postal terminal, New Haven, Conn., Samuel Pearson Inc., Boston, general contractor
200 tons powerhouse framing, also gates, hoists etc., Little Porcupine project, Montana, bids invited by Bureau of Reclamation, Denver, about Jan. 20.

REINFORCING BARS . . .

REINFORCING BARS PLACED

700 tons, buildings and facilities, Chemical Corps Training command, Fort MacClelland, Ala., to Virginia Steel Co., Richmond, Va.
Slabs, Construction Co., New Orleans, general contractor.
150 tons, test laboratory, naval shipyard, Portsmouth, N. H., to Concrete Steel Co., Boston; Farina Bros. Co., Newton, Mass., general contractor.
125 tons, state bridge and highway project, Vernon Tolland & Co., to Bethlehem Steel Co.; M. A. Gammino Construction Co., Providence, R. I., general contractor.
Barracks and mess hall, Great Falls, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle; Treve & Legland, Seattle, general contractors.
150 tons, facilities, Ault Field, Washington, title to Bethlehem Pacific Coast Steel Corp., Seattle; Valley Construction Co., Seattle, general contractor.
100 tons, sludge disposal structures, sewage treatment plant, Washington, to Fabricated Steel Corp., that city; Charles H. Tompkins Co., Washington, general contractor.
200 tons or more, Spaulding school, Newton, Mass., to Truscon Steel Division, Republic Steel Corp., Boston; and Security Steel & Wire Works, Boston; Rich Bros. Construction Co., Boston, general contractor.
100 tons, state highway bridge, Simsbury, Conn., to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.; Jones Construction Co., Columbia, Conn., general contractor.
100 tons or more, warehouse, Marine Corps supply depot, Albany, Ga., to Joseph H. Fox & Co., Birmingham; Eaton-Cook Co., West Point, Ga., general contractor.
100 tons or more, medical school and teaching hospital, University of Mississippi, Jackson, Miss., to Contractors Material Co., Jackson; Farnsworth & Chambers Construction Co., Houston, general contractor.
100 tons or more, operation, garage and supply building, naval air base, Norfolk, Va., to Hall-Hodges Co., Inc., Norfolk, Va.; Virginia Engineering Co., Inc., Newport News, Va., general contractor.
100 tons or more, housing project, Bridgeport, Conn., to Truscon Steel Division, Republic Steel Corp., New York, and Grossman Steel Stair Corp., New York; E. & F. Construction Co., Bridgeport, general contractor.
100 tons or more, housing project, New Britain, Conn., to Ceco Steel Corp., New York; Fringe Construction Co., Bridgeport, Conn., general contractor.

REINFORCING BARS PENDING

1,000 tons, Columbia Point, housing project, Boston, John Boxen Construction Co., Boston, job.
2,000 tons, Little Porcupine powerhouse, Montana, bids to Bureau of Reclamation, Denver, to be invited about Jan. 20.
1,053 tons, superstructure, twin bridges, Cuyahoga river, Summit county, Ohio, bids Jan. 11, Ohio Turnpike Commission, Columbus, O.
1,000 tons, Commonwealth pier No. 1, East Boston terminal, Boston, Raymond Concrete Pile Co., New York, jobs.
1,000 tons, maintenance-traffic depot and laboratory, State Department of Public Works, Route 9, Wellesley, Mass., Carter Construction Co., Boston, jobs.
425 tons, Garden State parkway, section 7, contract 14, Middlesex county, New Jersey, general contractors, bids Jan. 26, the steel to be furnished by the New Jersey Highway Authority as specified, also 9,000 linear feet of steel bearing piles.
150 tons, superstructure, twin bridges over Maumee river, Ohio turnpike, Lucas and Wood counties, Ohio, bids Jan. 21, Columbus, O.
135 tons, bridges and culverts, Ohio turnpike, Mahoning county, Ohio, bids in, to Ohio Turnpike Commission, Columbus, O.
365 tons, substructure, twin bridges, Maumee river, Ohio turnpike, Lucas and Wood counties, Ohio; also 250 tons, low alloy steel, protection plates and 3400 linear feet of steel piling, bids Jan. 21, Ohio Turnpike Commission, Columbus, O.
220 tons, bridge superstructure, Missouri river, Kansas City, Mo., also 9000 sq. ft. open grating.
200 tons, substructures, five overpasses, West Virginia turnpike, Raleigh county, West Virginia, bids in.
100 tons, piers and abutment, Four Mile Fork bridge, West Virginia turnpike, Kanawha county, West Virginia, bids in.

PLATES . . .

PLATES PLACED

325 tons, oil storage tanks, New Haven Terminal Inc., New Haven, Conn., to Bethlehem Steel Co.
300 tons, tank, Socony Vacuum Oil Co., Sackett's Harbor, N. Y., to Bethlehem Steel Co.
100 tons, water tank, Convent, La., to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

150 tons, boiler plate, Corps of Engineers, Pittsburgh, also 100 tons carbon steel bars, bids in.
150 tons, Corps of Engineers, Kansas City, Mo.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Atchison, ten 1200-hp diesel-electric switchers, to Fairbanks, Morse & Co., Chicago.

RAILS PLACED

Great Northern, 1800 tons of tie plates, also 100 tons of nuts and bolts, to Bethlehem Pacific Coast Steel Corp., Seattle.

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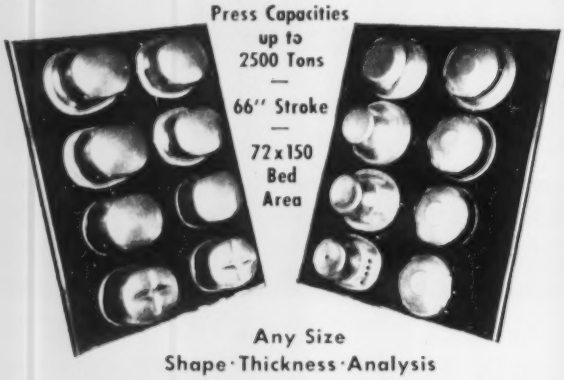

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Industrial Smelting Opens Plant

Industrial Smelting Inc. formally opened its $100,000 aluminum smelting plant in Youngstown. The firm will smelt extrusion scrap for Trimedge Inc., manufacturer of metal trimming, and Aluminum Air Seal Corp., a manufacturer of storm windows and doors. Equipment includes three gas-fired crucible type tilting furnaces. Some laboratory equipment will be added later so that the firm can smelt other types of alloys and accommodate other customers.

Allied Chemical Plans Expansion

Allied Chemical & Dye Corp., New York, is expanding the research and engineering facilities of its Nitrogen Division at Hopewell, Va. The $1 million project is scheduled for completion in May.

Mesta Honors Veteran Employees

Mesta Machine Co., Pittsburgh, made its fifth annual distribution of service awards to those employees who have served the company for 10 to 50 years. This year 289 employees were recipients of the awards. Of these, three rounded out 50 years of service and were presented with watches: Lorens Iversen, president; Carew W. Beers; and Nicholas A. Falce.

Work Starts on Canadian GE Plant

Ground has been broken for a 28,000 sq ft addition to the Canadian General Electric plant in Barrie, Ont.

Gets Control of Metal Products Firm

Chesapeake Industries Inc., West Point, Va., purchased more than 95 per cent of the capital stock of Virginia Metal Products Corp., manufacturer of metal doors, window frames and partitions.

Harrisburg Steel Plans Merger

Harrisburg Steel Corp., Harrisburg, Pa., plans to merge with Heckett Engineering Inc. The latter firm specializes in the reclamation of raw material, primarily used in steel plants, and now owns operating facilities at 11 major steel plants in the United States and Canada. If the proposal is approved by stockholders at a special meeting Mar. 17, Eric H. Heckett will become chairman of the board of Harrisburg Steel Corp. while Joseph T. Simpson will continue to act as president and chief executive officer. Mr. Heckett will continue to serve as president of Heckett Engineering in charge of its operations. Harrisburg Steel also will acquire Heckett's subsidiaries, including Heckett International Corp.

Quaker Rubber Completes Project

Installation of two large conveyor belt presses marks completion of the $250,000 belt department expansion at Quaker Rubber Corp., a division of H. K. Porter Co. Inc., Philadelphia.

Motor Products To Build Addition

Deepfreeze Appliance Division, Motor Products Corp., Detroit, is building a $1.5 million addition to its plant in Lake Bluff, Ill., which will permit an increase of 100 per cent in its production of home freezers.

Reynolds Metals Appoints Agent

Reynolds Metals Co., Louisville, appointed Nathan Trotter & Co., Philadelphia, as distributor of its primary aluminum to foundries in that area.

Large Military Projects Pend

Military construction projects totaling $314 million are scheduled to be under contract by April through the Seattle, Walla Walla, Wash., and Alaskan district offices of the Corps of Engineers. More than 300 individual jobs are planned. The breakdown by district offices is: Seattle, $16.3 million for Army projects and $26.7 million for Air Force work; Walla Walla, $2.5 million for Army construction and $28.2 million for Air Force; Alaska, $125 million for Army and $115 million for Air Force.

Sharon Steel Forms Subsidiary

Sharon Steel Corp., Sharon, Pa., organized Brainard Steel Canadian Division as a subsidiary which will have general offices and a plant in Toronto, Ont., manufacturing various steel strapping products. P. J. McArthur is general manager of the division.

Ford To Boost Transmission Output

Ford Motor Co., Dearborn, Mich., plans to expand the capacity of its Automatic Transmission Division in the Cincinnati area. Tentative plans call for construction of a manufacturing plant with 350,000 sq ft and provision for possible expansion. The first portion, part of which probably would be devoted to defense production, may be in operation late in 1953 or early in 1954. The new plant in Sycamore township, Ohio, would serve solely as a manufacturing facility, while the present plant

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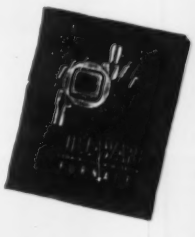

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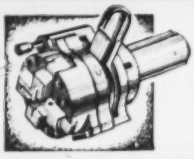

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Rocking, Revolving, Helps Make Mercury Switches

A constantly revolving, rocking drum speeds Minneapolis-Honeywell Regulator Co.'s production of mercury switches. Designed by the company's aeronautical division, the drum tilts switches back and forth about 11,520 times daily until it completes 36,000 cycles for each of the 1000 switches it carries. Rocking action distributes in glass tubes a lubricant necessary to asure free flow of mercury

on Red Bank road would continue to manufacture and assemble transmissions. Borg-Warner Corp., Chicago, which now builds about half of the automatic transmissions used by Ford, would continue to produce under contract with Ford Motor Co.

Lebanon Steel Foundry Opens Shop

Lebanon Steel Foundry, Lebanon, Pa., opened on Dec. 30 its Centri-Die shop, having a capacity of 200 tons of high alloy centrifugal steel castings a month. New equipment includes: Three Ajax high-frequency furnaces; four centrifugal casting machines; two heat-treating furnaces; eight boring mills; and a large radial press.

Heil Co. Leases Building

Heil Co., Long Island City, N. Y., leased a building at 19-35 42nd St., that city. The company manufactures truck bodies and truck loading equipment.

National Lead Buys Ore Deposits

National Lead Co., New York, purchased several thousand acres of mineral-bearing lands, containing titanium and zirconium ores, near Jacksonville, Fla. The company ships the ore to St. Louis and Sayreville, N. J., where it is processed into titanium dioxide pigments and to Niagara Falls, N. Y., for processing into ceramics, refractories, zirconium alloys and chemicals. National Lead has large deposits of titanium at its

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BLUE TEMPERED SPRING STEEL

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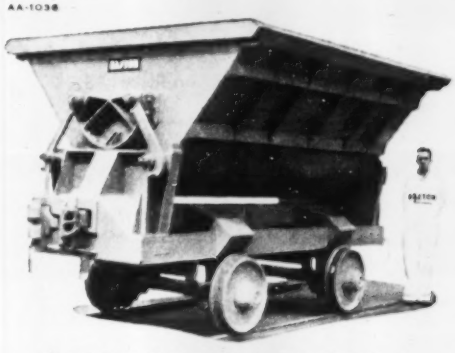
Phone: Grove Hill 6-2600

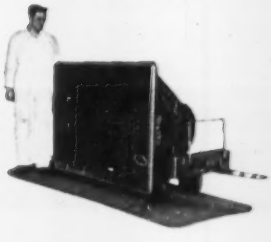
Fenner Street, Providence, R. I.
Phone: Gaspee 1-3573, 1-8573

AA-1038



Rocker Dump Cars, gravity dump to either side. Capacities 18 cu. ft. to 8 cu. yds.

Rocker Dump Trailers for all purposes on steel, solid rubber or pneumatic tires.



EASTON

ROCKER DUMP Cars and Trailers

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

MacIntyre development in the Adirondack mountains, New York, and has titanium mines and plants in Norway.

Quaker State Metals To Build

Quaker State Metals Co., Mountville, Pa., successor to New Holland Metals Co., manufacturer of aluminum sheeting and other building accessories, will build a plant in Lancaster, Pa. Luria Engineering Co., Bethlehem, Pa., was awarded the contract.

Baker-Raulang Buys Lull Mfg. Corp.

Baker-Raulang Co., Cleveland, manufacturer of industrial trucks, acquired Lull Mfg. Corp., Minneapolis, and will operate it as a subsidiary under the name of Baker-Lull Corp.

Testing Machine Maker Moves

Steel City Testing Machines Inc. moved to larger quarters at 8817 Lyndon Ave., Detroit 21. Louis Welt is president.

John Hewson Appoints Agent

John Hewson Co., New York static controls and insulation testers appointed A. R. Hough Co., Knoxville, Tenn., as its representative in that territory.

Walker Mfg. Leases Warehouse

Walker Mfg. Co., Racine, Wis., manufacturer of automobile hydraulic equipment and mufflers, leased a warehouse at 47-30 29th St., Long Island City, N. Y., which will be used for its eastern office and warehouse.

Gerrard Opens Service Section

Gerrard Steel Strapping Division, United States Steel Corp., Chicago, will open a product service section under the direction of Harry Reed, central district sales manager. Martin M. Groark, assistant manager, is in charge of light duty and specialty products while Richard G. Patterson, assistant manager, is in charge of heavy duty products. The new section will make available to shippers a specialized service to help them solve their packaging reinforcement problems.

WANTED TO BUY

One 4" or 5" National Upsetter (forging machine). Must be suspended slide type, 1925 model or later.

Please give serial number and all particulars in first letter or wire.

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MECHANICAL DESIGN ENGINEERS

Positions available for Design Engineers with experience in the design of mechanical equipment used in Blast Furnaces, Open Hearth Furnaces, Sintering Plants, Rolling Mills and other auxiliary plants for the processing and production of iron and steel. These men must have experience in Steel Plant layout as well as the design of equipment involved. These are permanent positions with excellent advancement opportunities for qualified Engineers who are interested in greater accomplishment.

If you qualify and are interested in advancing with a continually expanding organization, write, giving complete resume of positions held and duties performed, education, age, salary desired, etc., to:

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Capable of detailing jigs and fixtures for welding and machining operations. Prefer men with desire to progress to supervisory capacity.

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A well-managed metal products company has challenging opportunity for a capable executive to direct multi-plant manufacturing operations.

Our company has a long record of profitable operation, employs 2500 people and is located in desirable city.

We would prefer a man 40-50 years of age with successful plant manager experience in fabricating either light or heavy metal products.

$30,000

The man in this position will report directly to our General Manager. This is a challenging opportunity for a man who would like to be a member of a hard-hitting management team in a progressive, fast-growing, $50,000,000 company.

Replies may be brief, will be treated in confidence and should include age and home telephone number. Write Box 644, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Positions Wanted

PLANT MANAGER: M.I.T. GRADUATE WITH 25 years' experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break-even charts, job evaluation, supervisory responsibility chart and labor relations. Capable administrator with excellent record. Write Box 632, STEEL, Penton Bldg., Cleveland 13, Ohio.

WORKS MANAGER. EXTENSIVE BACKGROUND IN THE MANUFACTURE OF SHEET METAL AND STEEL PRODUCTS INCLUDING STAMPINGS, BINS, FORMS, CABINETS, STRUCTURES, WELDMENTS, CODE VESSELS, AND MACHINERY. EXPERIENCED ALL TYPES FABRICATING EQUIPMENT, MACHINE SHOP, TOOL ROOM, HEAT TREAT, FINISHING, AND MAINTENANCE. EXPERT IN METHODS. DIRECT ALL PHASES OF OPERATION INCLUDING ENGINEERING, PRODUCTION CONTROLS, PERSONNEL, PROCUREMENT, ETC. COLLEGE EDUCATED, PRACTICALLY TRAINED. WRITE BOX 638, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

Help Wanted

STEEL SALESMAN: BAR MILL PRODUCTS. Territory Atlantic seaboard principally southeastern States. Salary and expenses with added incentive compensation. Reply complete resume stating salary expected. Write Box 643, STEEL, Penton Bldg., Cleveland 13, Ohio.

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WITH SOME ENGINEERING BACKGROUND AND FAMILIAR WITH STRUCTURAL STEEL FABRICATING AND ALLIED INDUSTRIES FOR MID-WEST TERRITORY. SALARY, EXPENSES AND COMMISSION. GIVE FULL INFORMATION—AGE AND QUALIFICATIONS. CORRESPONDENCE CONFIDENTIAL. WRITE BOX 625, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

SALES MANAGER'S OPPORTUNITY
An aggressive Chicago manufacturer with a number of products going to plumbing, hardware, refrigeration, steel and industrial fields needs a young sales manager with experience. Must know how to set up sales organization and be willing to travel. The right man after proving himself can acquire interest in business from owners who eventually want to retire. Reasonable salary to start with, something to work forward to in ownership. Replies held in confidence. Box 642, STEEL, Penton Bldg., Cleveland 13, Ohio.

PHYSICAL CHEMIST: Conduct basic research in an industrial laboratory on the physical chemistry of liquid metals. Organize and execute program leading to practical improvements in methods and materials for the oxidation, deoxidation, desulphurization etc. of steel and the solution of other problems encountered in the melting of steel and other metals. Please send outline of qualifications, personal background and educational summary. Write Box 645, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Opportunity for Sales Representatives
Who do Missionary Work
An aggressive Chicago manufacturer has an opening for sales representatives on a commission basis that are willing to do missionary work on their products. The lines are nationally advertised and territories protected. Earnings are directly in proportion to effort. Products are consumed and steady repeat business results. Write outlining lines handled, territory covered. Box 640, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES REPRESENTATION
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SALARIED POSITIONS $3,500 TO $35,000. WE offer the original personal employment service (established 43 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y.

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USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Double Sheathed, 50-Ton Capacity
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Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

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One 2-Mev Van de Graaff Generator, output 1400 r per minute at 40 cm, inverse linear with equivalent to 6 mm lead. Rugged construction, stable and dependable output. Suitable for industrial radiography, for research particularly where an electron current greater than 100 microamperes is desirable, or for radiation therapy.

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Offers and bids welcomed. Will consider exchange for equipment or materials needed for hospital expansion program.

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4" x 4" x 6" Aircraft quality
For remelt
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750 sheets—18 ga. 36" x 96" HR Black Sheets
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40,000 ft.—1½" Cold Formed Channels

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1,200 Oxygen Cylinders, 244 Cu. Ft. Capacity
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150 D Size Nitrous Oxide, Filled
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All above cylinders listed in excellent shape

2 OXYGEN PLANTS, Independent 02-B, new 600 cu. ft. per hour, 20-25 meters, complete less power unit $7,500 each
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1 OXYGEN PLANT, Air Products, 600 Cu. Ft. per hour, complete, liquid pump type, used
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Dan'l Boone Still Wields a Hammer

THE ANVIL rings with an old sound in the forge of Daniel Boone VI. At his blacksmithing shop in Burnsville, N. C. he follows the ancient trade of his illustrious great, great, great, great grandfather, using methods that haven't changed in centuries.

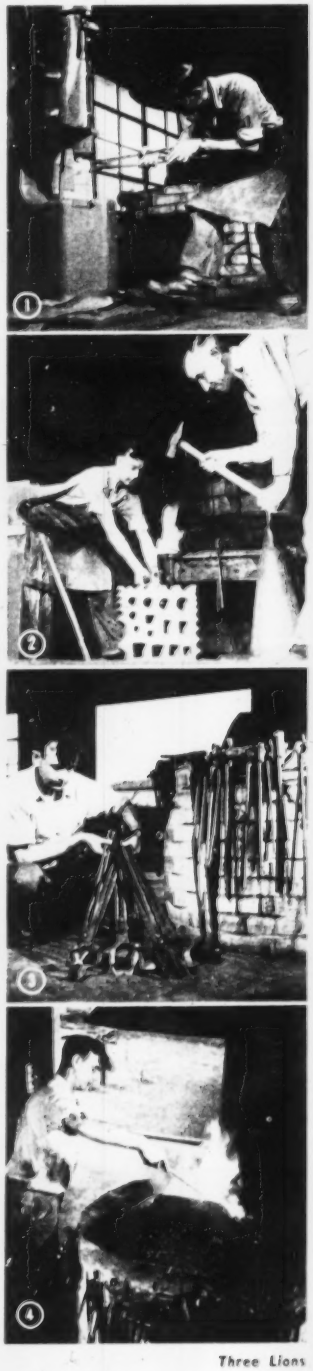
Architects, builders and interior decorators look to his forge as a source for authentic wrought iron hardware and decorative pieces. Working almost entirely by hand, he turned out the wrought iron pieces used in the restoration of colonial Williamsburg in Virginia. He takes as long as a week to turn out a pair of andirons.

Aside from a power grinder, Mr. Boone's lone concession to modern methods is a steam hammer (1) on which he beats out iron balls for andirons. He welds with the forge and hammer.

Most complex of his antique tools is the swage block (2), a slab of steel with various geometrical contours cut into it. He forms circular shapes on the steel cone visible in the picture.

Since few of the tools Mr. Boones needs are available from manufacturers, he must make his own. He has a bewildering array of tongs and hammers, each with its special use (3).

Sometimes in the opinion of other smiths he carries tradition to amusing lengths, as when he heaps up the forge coal in two neat opposing pyramids with the fire between (4). But apparently tradition pays. Mr. Boone gets about $1000 for a large set of andirons.



Three Lions

Alling-Lander Co. Reorganized

Alling-Lander Co., Rochester, N. Y., manufacturer of gears and speed reducers, was reorganized from a partnership to a corporation. William H. Lander, senior partner, was elected chairman of the board; Richard E. Raleigh, president and general manager; C. Wheeler Bishop, vice president and treasurer; Fred A. Smyth, vice president and secretary.

Geerpres Wringer Boosts Output

Modern materials handling techniques are speeding production of commercial and industrial mop wringers and allied floor cleaning equipment at Geerpres Wringer Inc.'s new plant at 1780 Harvey St., Muskegon, Mich. The building represents an increase of about 100 per cent in manufacturing capacity.

Onan Opens Export Office

D. W. Onan & Sons Inc., Minneapolis, manufacturer of electric generating equipment, opened an export office at 141 Broadway, New York. A. S. Callan is manager of the office.

Machinery Firm Leases Plant

American Machine & Foundry Co., New York, leased a building in Buffalo for defense production. Part of the plant is being used for the final assembly of oil cooler fans which the company is making for Army tanks. This is the firm's second plant in the Buffalo area. The assembly line operations have been moved from the company's main plant in Cheektowaga, N. Y., releasing about 30,000 sq ft of space for manufacturing.

Sun Oil To Build Pipeline

Sun Oil Pipeline Co. of Canada will be organized as a subsidiary of Sun Oil Co., Toronto, Ont., to build and operate a pipeline from Sarnia, Ont., to Toronto. Sun Oil Co. is building a refinery at Sarnia.

Intoco Sales Appoints Agent

Intoco Sales Co., Chicago, named Larry Hammond Co., Milwaukee, as its sales representative for the southern and eastern portions of Wisconsin. The company is engaged in the machine and tool business.

Coal Researchers Plan Laboratory

Bituminous Coal Research Inc., Pittsburgh, will operate an industry-research laboratory. A building will be leased in Columbus, O., to house the Columbus staff of the organization and to provide facilities for design, development and pilot-plant testing of equipment and processes being investigated under its general research program.

...make gloves last

3 to 5 times LONGER!

THIS IS WHAT "WASH-RITE" DOES...

Throw *all* your dirty, worn leather, rubber or cotton gloves in our steel drum. Ship to us. We correctly clean, sterilize, *COMPLETELY REPAIR*, sort, reshape, pair and ship them back to you as serviceable as new. Depending upon the gloves and their usage, gloves are being re-claimed by us 3 to 5 times. We specialize only in laboratory controlled re-claiming of rubber, leather and cotton gloves, aprons and clothing. *Write for literature.*

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First Mortgage 4¼% Bonds, Series A

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Glore, Forgan & Co. Smith, Barney & Co.

January 12, 1953

SIMONDS is geared to serve you *fast* on all large and heavy-duty industrial gear requirements. You get personalized attention, with accuracy and quality assured by nearly 60 years of specialized experience. SIMONDS' central location assures prompt delivery on all types and sizes, up to 145" in dia. and including cast or forged steel, gray iron, bronze, Meehanite, rawhide and bakelite. SIMONDS also is stock carrying distributor for Ramsey Silent Chain Drives and Couplings, and industrial V-Belts.

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THE AETNA-STANDARD ENGINEERING COMPANY

Leading Engineers and Builders of CONTINUOUS BUTT WELD PIPE MILLS

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Head Wrightson Machine Company, Ltd., Middlesbrough, England. Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y. Mexico, Central and South America.

Societe de Constructions de Montbard, Paris, France. France, Belgium, Holland, Luxembourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany. Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy. Italy.

Aetna Japan Company, Ltd., Tokyo, Japan. Japan.

Hale & Kullgren, Inc., Akron, Ohio. Representative for the Rubber Industry.

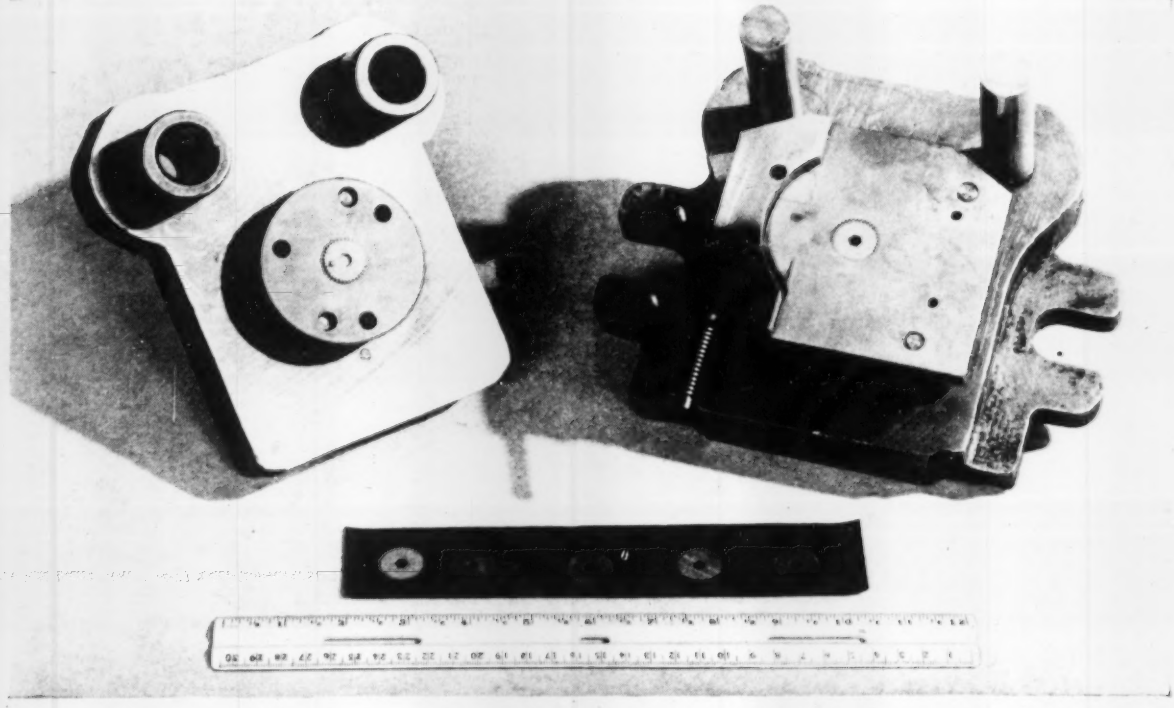
Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

Aetna-Standard

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio · Ellwood City, Pennsylvania

Graph-Mo® steel dies produce up to 80,000 parts without throwing burrs!



THE Reliable Tool and Die Company, Cleveland, Ohio, was having trouble with the chromium and carbon dies it used in making small, intricate gears and parts for electric motors and toy mechanical winding motors.

The dies were throwing burrs. The parts often tore when broached. Gear teeth spalled in the dies. And die life was short due to chipping of the cutting edges.

Then Reliable's engineers tried Graph-Mo*, one of four Timken* graphitic tool steels. The Graph-Mo blanking dies produced as many as 80,000 parts without a single burr. Because of free graphite in its structure, Graph-Mo has outstanding low-friction properties: minimum tendency to scuff, seize, score or gall. Tearing and spalling were eliminated. And the cutting edges stayed sharp and true because the diamond-hard carbides in Graph-Mo give excellent resistance to wear and abrasion.

Graph-Mo also offers other advantages. It responds uniformly to heat treatment, permitting close tolerances in the parts. It has good stability, and is easier to machine than ordinary tool steels.

For information on the four Timken graphitic-tool steels and their use in punches, dies, gages and machine parts, get the new 10th edition of "Timken Graphitic Steel Data Book". Write on your business letterhead to The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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